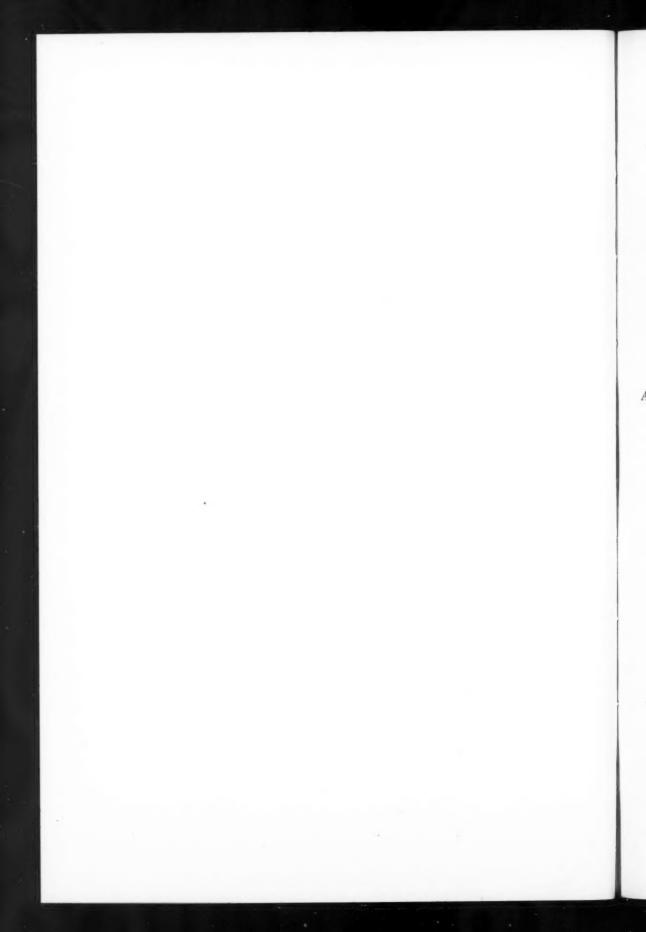
**Dental** 

**Abstracts** 

a selection of world dental literature





A selection of world dental literature

Lon W. Morrey, D.D.S., editor N. C. Hudson, assistant editor

#### SECTIONS

Anesthesia and analgesia page 601 Bacteriology page 627 Biochemistry page 620 Case reports page 593 Endodontics page 595 Extractions page 597 Fractures page 596 General page 630 Histology page 613 Oncology page 625 Operative dentistry page 579 Oral surgery page 599 Orthodontics page 581 Pathology page 621 Pedodontics page 583 Periodontics page 584 Physiology page 628 Prosthetic dentistry page 587 Public health dentistry page 615 Roentgenology page 606 Therapeutics page 608 New equipment page 635 Doctoral and Masters' dissertations page 636

### AMERICAN DENTAL ASSOCIATION 222 E. SUPERIOR ST. CHICAGO 11

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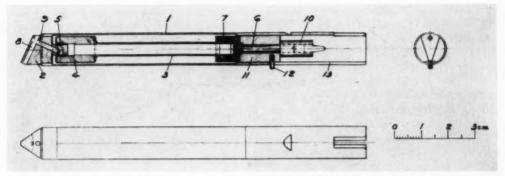


Figure 1 Schematic drawing of Inka intraoral vibrator



### A new vibrator for amalgam condensation and removal of calculus

Sam Karlström. J.Pros.Den. 10:586-590 May-June 1960

The Inka intraoral vibrator is an amalgam condenser designed according to the principles used by Freyssinet in his design of mechanical equipment to make concrete by vibrating the mix.

The moving components of the instrument (Fig. 1) are enclosed in a cylindric steel casing (1). One end of the casing is open and designed for connection directly to the dental engine. The other end, the vibrator head (2), is closed so that the interchangeable points can be fixed therein. The vibrations are produced by a rotor (3) which consists of a cylindric oscillating rod that rotates about its own axis as a centrifugal pendulum. The free end of the rotor is shaped as a hollow body (4) and rolls on a pin (5). The pin constitutes the inner part of the vibrator head, which is firmly attached in the cylindric casing. The cylindric rod (3) is connected to the drive shaft of the dental engine (6) by means of an elastic coupling (7). The coupling is arranged to allow free oscillation of the rotor in relation to the drive shaft. The rod cannot rotate independently of the shaft.

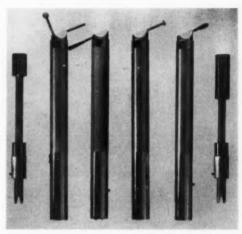


Figure 2 The vibrator has various types of points and two rotors. The light rotor (left) is used for condensing amalgam. The heavier rotor (right) is used to remove calculus

The coupling consists of a rubber sleeve inserted between the end of the drive shaft and the rotor, which overlap one another.

The vibrator head is provided with two channels (8 and 9) drilled at different angles, which take the points. One channel forms an angle of 25 degrees with the axis of the vibrator, and the other channel is perpendicular to the former. Since one of the channels passes through the vibrator head, it is possible to insert the points from either end. The points are shaped according to the purpose for which they are intended, such as a spatula, a chisel, a knife, a disk, a tenon or a spherical body (Fig. 2).

The shaft of the point, the diameter of which is slightly less than that of the channel, is flexible and slightly curved. When the shaft is pushed into the channel, it is held firmly by friction in any desired position.

The rotor and driving shaft, which are connected to the dental engine by a claw coupling (Fig. 1, 10), have their bearing in the cylindric casing by means of a piston (11). A fixed pin (12) in the piston passes through a longitudinal slit (13) in the casing. The pin permits the rotor with the piston and the driving shaft to be withdrawn from the casing for inspection or change of the rotor. A light rotor is used to vibrate amalgam. A heavier rotor is used to remove dental calculus.

The following advantages are claimed for the Inka vibrator:

1. It provides soft, elastic sine curve vibrations that affect the entire mass of amalgam. The soft vibration provided is better tolerated, especially by children, than the percussion effect.

- 2. Pressure is not necessary for the amalgam mass to be affected by the instrument.
- The points used for condensation of amalgam may be placed in the vibrator in three directions, so that the instrument may be used easily in any situation.
- 4. The point is rotatable about its axis and remains firmly in position even under vibrational stress. The point can be rotated in various positions while the vibration is in progress.
- 5. Since the point is fixed in position, the instrument can be used as an ordinary amalgam plugger, or as a combined plugger and vibrator.
- 6. Only a moment is required to change the points.
- 7. When the larger rotor is fitted, the Inka intraoral vibrator can be used for removing calculus.
- 8. The vibrator casing is easily sterilized by the usual procedures.

Nygatan 37, Gävle, Sweden

### A quick-setting zinc oxide-eugenol mixture

D. C. Smith. *Brit.D.J.* 108:232 March 15, 1960

In 1958 Smith described the clinical and economic advantages of a zinc oxide-eugenol mixture containing an especially active oxide. A disadvantage of the mixture was the yellowish-grey shade of the set mass; however, clinical experience has shown that this disadvantage is not so important as was at first thought.

A quick-setting zinc oxide-eugenol mixture can be produced and used in the following way:

The oxide is made from a pure grade of zinc carbonate that is virtually free from arsenic and lead. An appropriate quantity to order is 250 Gm., all of which need not be converted to oxide at one time. A suitable quantity of carbonate is placed in a shallow porcelain, earthenware or

heat-resistant glass dish to a depth of not more than % inch. The dish is placed in an oven or furnace (preferably electric) preheated to 350° to 400°C., and left at that temperature for 20 minutes. It is then removed and allowed to cool.

Pure eugenol may be obtained through a dental supply house. The oxide is mixed rapidly with eugenol when required to a thick consistency which is transferred to the cavity with as little further manipulation as possible. Mixing should be thorough, but tests of crushing strength have shown that overspatulation or overmanipulation gives a lower strength. The mixture sets in the mouth rapidly (three to four minutes from the beginning of spatulation). If quicker setting is desired, one drop of water or less may be added to the mix on the slab. Too much water results in a brittle product on setting.

Turner Dental School, Manchester, England



# New method to determine sagittal deformities of the upper jaw

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Oğuz Baz. Rev.mens.suisse odont. 70:53-54 Jan. 1960

Sagittal deformities of the upper jaw usually are manifested by protrusion or retrusion of the jaw; both protrusion and retrusion of the jaw produce severe and unesthetic disfigurations of the face.

Several authors, especially Simon, Dreyfus, Izard, Andresen and Majy, have suggested the use of photographic, gnathostatic and cephalostatic teleroentgenographic methods to determine the cause and effect of these morphologic changes of the upper jaw.

Other authors, Beauregardt, de Nevrezé, Okyay and the author, suggest utilization of direct methods to diagnose all deformities occurring in the upper jaw.

An investigation of 32 adult patients of both sexes with sagittal deformities of the upper jaw was carried out at the Dental Institute of the University of Istanbul, Turkey. The distances between the central point of the meatus acusticus (auditorius) externus and all the points of the profile (Fig. 1) were measured and recorded. By comparison of the data obtained it became evident that a definite relation exists between the distances of the auricular-ophryon points and the auricular upper lip points. These distances (Fig. 2) and their differences are presented in tabular form (Table).

A study of the table reveals that these two distances are equal in 62 per cent of patients with sagittal deformities of the upper jaw, with a range in deviation of only 2 mm.

This method of measurement, using an apparatus devised by the author, can be applied satisfactorily in roentgenographic examination of the

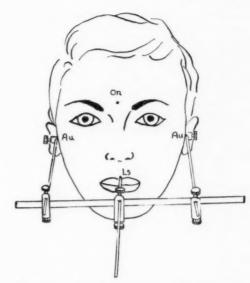


Figure 1 Profilometric measurement of the distance between the central point of the meatus acusticus externus and the profile points

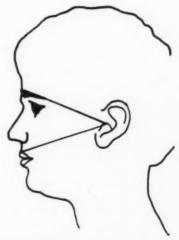


Figure 2 Profilometric measurement of the distance between the ear-lip points and the ear-forhead points

Table Data obtained with the profilometer in 32 patients with sagittal deformities of the upper jaw

AuOn.	Aulab.s.	Dif
107	108	1
143	146	3
104	104	0
97	97	0
108	110	2
103	104	1
97	97	0
103	104	1
107	104	3
97	98	1
100	100	0
120	120	0
130	130	0
101 105	97	4
105	105 103 104 112 110	0
100	103	3
100 107 114	104	3
114	112	2
104	110	6
130	134	4
103	104	1
103 141	108 136	5
126	136	1
135 135	140	6
138	138	0
137	140	3
132	134	2
144	143	ī
144	145	î
145	148	3
100	100	13000210013100004403326415515033211330

profile to determine accurately the two distances (ear-lip and ear-forehead). The fact that growth and development frequently undergo profound variations and divergences must be taken into consideration. It can be assumed that the result obtained in 62 per cent of patients can be applied satisfactorily to clinical, dental (especially orthodontic) practice. Because it is not advisable that diagnosis be based on one measuring method alone, profilometric technics will be useful for verification of results obtained by other methods and

for determination of sagittal deformities of the upper jaw.

Orthodontic Institute of the University of Istanbul, Turkey

### Orthodontic treatment for children

J.A.M.A. 172:1575 April 2, 1960

Q.—A ten year old girl has moderately severe malalignment of her teeth. Should orthodontic treatment be started immediately or should it be postponed until more of the teeth are permanent and growth is almost complete?

A.-The correction and prevention of malocclusion should be started as soon as possible after diagnosis. Treatment usually is more successful and of shorter duration if initiated in early childhood, when the developmental condition of the bones permits relatively rapid realignment of the teeth, the interrelationships of the jaws are not so firmly established, and unerupted teeth can be guided into position by comparatively simple appliances and therapeutic procedures. The ten year old patient should be referred at once to a dentist for preliminary evaluation and to an orthodontist if the dentist judges the condition to require such specialized treatment. The alert physician can forestall serious orthodontic and subsequent personality problems in young patients by prompt referral, whenever dental abnormalities are observed or suspected.

535 North Dearborn Street, Chicago 10, Ill.



### Dental problems of noninstitutionalized mentally retarded children

John R. Snyder, Judith J. Knopp and William A. Jordan. North-West Den. 39:132-133 March 1960

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From July 1958 to July 1959 the Dental Health Section of the Minnesota State Health Department conducted a study of the dental problems of 113 noninstitutionalized mentally retarded children at the Fergus Falls (Minn.) office of the Four-County Project for Retarded Children.

Forty-four of the 52 dentists in the four counties (Becker, Clay, Otter Tail and Wilkin) were interviewed. All but one dentist had done work on handicapped or retarded children. Most of the dentists were interested in a course on technics and methods of treating retarded children, and said they would attend such a course if it was offered at a convenient time and place. Obstacles in providing dental care for these children include inadequate dental facilities, especially in hospitals; lack of understanding and assistance of parents and of some hospital personnel; operative and patient management problems, and time and financial difficulties.

Parents of 96 of the children were interviewed and all expressed willingness to secure any dental care deemed necessary, and to cooperate with diet and home care procedures.

The 113 mentally retarded patients examined were between 1 and 19 years old, with a mean age of 9.4 years; 67 were boys and 46 were girls.

The average number of DMF and def teeth and tooth surfaces was less for the 113 children than for average children in the same age groups. However, only 3 per cent of the def deciduous teeth of the children 5 to 9 years old had been filled, compared to more than 40 per cent for average children in the same age group. Only 17 per cent of the DMF permanent teeth in children 13 to 17

years old had been filled, compared to 50 per cent for average children. Percentages of teeth lost were higher for mentally retarded children in all age ranges for both dentitions. The urgent need for dental service was evident.

Aside from simple gingivitis, 75 of the 113 children (66 per cent) had more severe forms of periodontal disease. Of those with periodontal disorders, 43 per cent had the whole mouth involved, and 41 per cent had a fourth or less of the mouth involved. The high prevalence and severity of periodontal disease in mentally retarded children are directly proportional to poor oral hygiene and inadequate and faulty toothbrushing habits.

Forty-eight per cent of the 113 children had malocclusions severe enough to require orthodontic treatment or consultation. Normal eruption of teeth was noted in 58 per cent of the children, and retarded eruption in 38 per cent. Four per cent had accelerated eruption.

Seventeen per cent of the children had good oral hygiene, and 25 per cent had poor oral hygiene. Keeping the mouth of the mentally retarded person clean is particularly difficult because of lack of coordination and understanding. Forty-two per cent of the children brushed their teeth at least once a day, but 16 per cent never used a toothbrush.

Oral and dental abnormalities were present in 41 children (36 per cent). The excessive use of sweet foods was reported in 17 per cent.

Thirty-seven per cent of the 113 children never had visited a dental office; 42 per cent had visited a dental office within a year's time—usually for emergency work only. Sixty per cent of the children were judged fully treatable and 23 per cent were judged untreatable; 17 per cent were judged to be partially treatable at the dental office.

Mentally retarded children are desperately in need of dental service. Most of these children are fully treatable in the office. The dentist should learn as much as he can about these children, and about hospital procedures for handling such dental patients. The dentist should take the time to inform and educate the parents and the children about good dental health procedures. Patience, understanding and kindness are imperative in working with these children.

Dental Health Section, Minnesota State Department of Health, Minneapolis, Minn.



# The effects of desalivation on periodontal tissues of the Syrian hamster

Om P. Gupta, Harry Blechman and S. Sigmund Stahl. Oral Surg., Oral Med.& Oral Path. 13:470-481 April 1960

Although an increasing amount of research is being conducted on the role of saliva in the etiology of dental caries, no definitive study has been done on the effect of desalivation on the periodontal tissues. The objectives of the present study were to determine the effect of the removal of the major salivary glands on the periodontal tissues of the Syrian hamster, and to observe the effect of diets of different composition and consistency on the incidence of periodontal lesions.

Sixty hamsters were divided into six groups. The major salivary glands of the animals in Groups 2, 4 and 6 were removed. The animals of Groups 1, 3 and 5 served as intact controls. The subjects of Groups 1 and 2 were maintained on a high carbohydrate finely powdered ration 4 (Keyes, 1956); those of Groups 3 and 4 were given laboratory chow pellets, and those of Groups 5 and 6, finely ground laboratory chow. After 12 weeks, all the animals were decapitated and the number and extent of the periodontal lesions in both soft and calcified tissues were evaluated.

The desalivated animals consistently showed a greater number and extent of periodontal lesions in the soft and calcified tissues than the controls. The differences were significant statistically.

The consistency and composition of diet seemed to play a role in the production of periodontal lesions in the hamster. The cariogenic ration 4 produced a greater number and extent of lesions in the soft and calcified tissues than either the laboratory chow or the ground laboratory chow. Ground chow produced a greater number and extent of lesions than laboratory

chow in pellet form. The effect of the diets appeared to be more severe on the soft tissues than on the calcified tissues.

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The microscopic findings substantiated the gross observations. The desalivated animals showed histologic changes of greater severity than the intact controls. The pronounced changes in the desalivated animals were apical migration of the epithelial attachment and the presence of epithelium at the interradicular area. The control and desalivated animals fed ration 4 showed severe osteoporosis, possibly a result of the nutritional inadequacy of the diet.

University of Illinois College of Dentistry, Chicago, 1ll.

### Studies on a hydrogenated fatzinc bacitracin periodontal dressing

Paul N. Baer, Charles F. Sumner and John Scigliano. *Oral Surg.,Oral Med.& Oral Path.* 13:494-498 April 1960

Baer and others reported (1958) that a dressing containing 3,000 units of zinc bacitracin per gram of powder is an effective postgingivectomy pack (D. ABS. 4:17-18 May 1959). However, surgical procedures now are being employed which expose extensive areas of alveolar bone. One, two or more weeks are required for the granulation tissue to cover the exposed bony surfaces. Since this delay in healing might be due in part to the eugenol content of the dressing, the purpose of this investigation was to develop and clinically test a periodontal dressing which does not contain eugenol.

The powder portion has the following formula: zinc oxide, 0.45 Gm.; rosin powder, 0.52 Gm., and zinc bacitracin, 3,000 units per gram of the other ingredients. The ointment portion consists of: zinc oxide, 42 per cent, and hydrogenated fat, 58 per cent. The powder is mixed with the ointment until a puttylike consistency is reached, after which the dressing is ready for use. The pack may be mixed weeks ahead of time, wrapped in aluminum foil and placed in a refrigerator. When needed, it is softened under hot water; if softened too much, it can be mixed with a little powder until the desired consistency is obtained.

Patients with gingivitis or periodontitis who required periodontal surgery as part of the therapy were used as subjects. The new periodontal pack was the experimental dressing. A dressing which contained the same powder mixed with eugenol and sweet almond oil in place of the ointment was used as a control. As a general rule, all dressings were removed at the end of one week and were replaced for an additional week.

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In 50 patients in whom there was extensive exposure of alveolar bone resulting from mucogingival surgery, the control dressing containing eugenol was placed over half the exposed alveolar bone, and the experimental dressing was placed over the other half. Of 660 patients in whom there was a moderate exposure of alveolar bone resulting from osteoplasty, 360 were treated with the experimental pack and 300 were treated with the control pack.

No allergic reactions or infection from Candida albicans occurred in either group.

The experimental dressing was much easier to handle, and adhered to the teeth better, than the control. The eugenol dressing caused some immediate discomfort (a slight burning sensation) and a eugenol taste in all patients, whereas the experimental dressing caused neither. In a fourth of the procedures involving extensive exposure of alveolar bone, the healing seemed to be at a more advanced stage at the end of the first week under the experimental pack (that is, the granulation tissue was smoother and not as red and granular as under the control pack). At the end of the second week, the healing was about the same under both dressings.

When the experimental dressing was applied immediately after mucogingival surgery, it was not necessary to use an extremely stiff mixture to obtain good results.

The eugenol pack developed sharp, annoying edges in about 5 per cent of the control patients. The experimental pack did not.

In the limited number of instances in which the experimental dressing was placed against an acrylic facing, no pitting of the acrylic resin occurred.

In 3 instances out of 435 in which the experimental dressing was used, a unilateral discoloration occurred on the side of the tongue in contact with the dressing. Smears from these areas were

negative for fungi. The discoloration disappeared on removal of the pack and the tongue was asymptomatic.

National Institute of Dental Research, Bethesda, Md.

# Albanese's syndromic triad in apical periodontitis

A. Messina. An.españ.odontoestomat. 18:927-933 Dec. 1959

Albanese (1939) called attention to the fact that patients with apical periodontitis often exhibit a specific symptom complex which involves simultaneously the digestive, respiratory and articular systems. This set of symptoms was later named Albanese's syndromic triad. Many patients with periodontal disease complain that the pain in the periodontal membrane or the gingival tissue increases whenever the colitis from which they suffer undergoes exacerbation.

Several dentists and physicians have recognized the possibility that a relation exists between periodontal disease and isolated or combined manifestations of Albanese's syndromic triad. Sabatini (1951) reported that successful treatment of amebic intestinal disease was followed by spontaneous improvement of the periodontal condition.

Other systemic diseases often associated with periodontal disease are diabetes mellitus and various forms of hepatobiliary and rheumatic disorders such as biliary lithiasis or gout, all of which may be regarded as manifestations of the so-called arthritic diathesis.

The relations between the various conditions of Albanese's syndromic triad and periodontal disease has sometimes erroneously been described as direct cause and effect, whereas it is more probably an indirect reaction reducing the resistance of the periodontal tissues to infection or inflammation by the presence of some or all manifestations of Albanese's syndromic triad.

Investigation of 1,000 patients with apical periodontitis, carried out at the Dental Clinic of the University of Milan, Italy, revealed that one or several of the syndromic conditions were present in 89.6 per cent. The coexistence of all three conditions, however, was extremely rare, occurring

in only 84 (8.4 per cent) of patients. Two symptoms of Albanese's triad were found in 28.4 per cent, distributed as follows: (1) articular and digestive disorders, 20 per cent; (2) articular and respiratory disorders, 6 per cent, and (3) digestive and respiratory disorders, 2.4 per cent.

The articular system, either alone or associated with one of the two others, was involved in 63.2 per cent; the digestive system, either alone or associated with one of the two others, in 48 per cent; and the respiratory system, either alone or associated with one of the two others, in 24 per cent. These frequencies differ somewhat from those given by Albanese. These differences, which relate principally to the involvement of the articular system, are undoubtedly due to a specific local cause, that is, the damp climate of Milan which inevitably influences unfavorably the condition of the joints.

The concomitant presence of Albanese's syndromic triad and apical periodontitis does not explain the origin of periodontal disease but it may provide valuable help in diagnosis and treatment of the disease. Patients improve more rapidly and continue to feel the beneficial effect of periodontal treatment when the specific dental care is supplemented by general therapeutic measures designed to control or correct the disorders associated with Albanese's syndromic triad, even if they are manifested in distant regions of the human body.

Via Cucchiari 19, Milan, Italy

### Periodontal disease and diabetes in young adults

Ralph C. Williams, Jr., and Charles J. Mahan. J.A.M.A. 172:776-778 Feb. 20, 1960

Chronic infection predisposes to difficulty in the regulation of diabetes, and may increase the patient's insulin requirements. The authors have been impressed by the frequency with which the young diabetic patients seen in a military practice manifest extensive periodontal disease which had been undiagnosed and untreated prior to entry in the service.

This study was undertaken to observe the effects of systematic periodontal therapy on the insulin requirements, diabetic control and periodontal health of nine patients ranging in age from 20 to 32 years. In each patient, diabetes had been controlled by standard methods of diet and administration of insulin or oral hypoglycemic agents. All patients manifested periodontal disease. In each patient, appropriate periodontal treatment and oral surgical procedures were carried out under local anesthesia as one procedure. Antibiotic therapy-300,000 units of procaine penicillin G and 0.5 Gm. of streptomycin given intramuscularly twice a day-was maintained for an average of ten days in each patient. Diabetic diets were continued during convalescent periods, with appropriate use of liquid and semisolid foods until gingival healing allowed a return to normal foods, usually after ten days.

Preoperative and postoperative therapy was coordinated between the periodontist and the internist. Insulin requirements and the state of diabetes were studied for a minimum of three months in each patient.

Seven of the nine patients showed significant subsequent reduction in insulin requirement. The average reduction in insulin dosage was 30 units of isophane (U-40, NPH) insulin, with a range of 10 to 55 units. One patient showed no change in insulin requirement, despite extraction of four teeth with nonvital pulps and extensive periodontal therapy. One patient with mild diabetes which originally had been controlled by diet alone later required oral administration of hypoglycemic agents for diabetic regulation. This was attributed to improvement in his eating habits after alleviation of gingival pain. Diets and caloric intakes in all other patients were not changed significantly during the course of the study.

The treatment of periodontal disease by surgery and extractions may improve the practical regulation of diabetic patients. Periodontal therapy in such patients need not be confined to small areas. Treatment of all pathologic changes in the periodontal region at one operation proved beneficial in selected patients.

U.S. Air Force Hospital, Maxwell Air Force Base, Air University, Montgomery, Ala.

Prosthetic dentistry

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### The jointed elastic splint in construction of partial dentures

Jörn Peter Gottfriedsen. Zahnärztl. Praxis 7:9-10 Aug. 1, 1959

Proper splinting of the anterior teeth usually presents a more difficult problem than that of splinting the posterior teeth.

The "BMB" elastic splint, developed by Beat Müller, makes proper splinting in both tooth regions less difficult. This splint may be used as a single attachment to unilateral free-end dentures or as a double attachment to bilateral partial dentures.

The construction of any mechanical device for tooth stabilization requires proper adjustment and alteration of the denture supporting tissues. In routine dental practice, however, these changes usually are executed by laboratory work made on casts, and the amount of vertical dimension lost, therefore, is determined only by trial and error.

The accurate and satisfying "BMB" splint consists of the following parts: (1) a four-edged tubule; (2) as many clasps as are required, and (3) a stainless steel spring. The splint can be constructed in the following manner:

1. Dry foil is placed over the teeth to be splinted as well as over the teeth serving as abutments for the partial denture.

2. Alginate impressions are taken of the upper and lower jaws. The tray should be keyed to the remaining teeth to be splinted in a manner which permits placing and replacing accurately. Before casting is completed, a plastic tray keyed to the remaining teeth should be used.

3. The impression is corrected, examined and reinserted as many times as necessary to obtain maximum coverage and controlled displacement of the subadjacent tissues. The continuous clasp, designed to keep the remaining teeth in position, is cast.

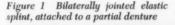
4. After the teeth to be splinted are checked for rotation, elongation and axial malposition, horizontal holes, parallel to each other, are drilled through each tooth.

5. The labial enamel is entered with a halfround bur mounted on a straight handpiece.

6. Precisely fitting pins, consisting of an alloy containing 85 per cent platinum and 15 per cent iridium, are placed into the holes.

7. Key forms are soldered to the lingual ends of the pins to assure proper retention.

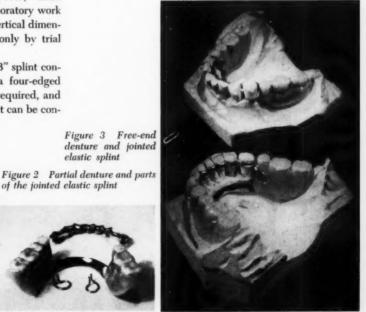
Figure 3 Free-end denture and jointed elastic splint







of the jointed elastic splint



- The design of the elastic splint is waxed to the cast which is trimmed and polished.
- Cementation is completed in a dry field. Slow-setting cement is placed within the splint and into the holes. The splint then is pressed into position, and during the setting of the cement, the cuspid pins can be inserted.
- 10. The partial denture is constructed, attached to the elastic splint, and tested in the patient's mouth.

The elastic splint provides rigid stabilization and esthetic improvement, and together with periodontal treatment and adequate home care it will permit many years of comfort and service from the previously loose teeth. Very little metal shows and the retention is extremely strong.

In the construction of the "BMB" splint, attached to partial dentures, there are many combinations that may be used, and in some instances fixed splints in conjunction with removable splints may be applied.

Proper design as well as functional factors, however, must be considered before an elastic splint is made for individual patients. It is necessary to give consideration also to the biologic factors of the teeth to be splinted as well as to the supporting tissues. Above all, the design of the splint and the partial denture must conform with good oral hygiene.

Allemannenstrasse 60, Singen am Hohentwiel, Germany

### A new investing process

R. Davidson Bell. *Brit.D.J.* 108:179-180 March 1, 1960

A new investing process, known as "Investril Plycast," has been presented for commercial use. Although the process has not yet been applied generally to dental use, dental inlays and larger prostheses have been invested successfully by using the technic.

The technic makes it possible to produce molds, ready for casting, in a matter of minutes from receipt of the wax patterns. Such molds can withstand temperatures up to 1,000°C. and can receive any of the molten metals or alloys used in dentistry.

The mold is made by producing a multilayer shell around the wax pattern. The shell is built up by a number of dippings in a refractory slurry, the excess slurry being allowed to drain away after each dipping. The first dipping is followed by a dusting with fine silica, and subsequent dippings by a dusting with coarser silica. Exposure of the dipping to an alkaline atmosphere results in a chemical reaction which produces hardness in about 30 seconds. The number of layers depends on the form of the wax and sprues. The most complicated patterns require six to eight dippings.

Without preliminary drying, the coated patterns are placed in a burn-out furnace where the temperature ranges from 800° to 1,000°C. This treatment quickly removes all traces of wax and volatile mold-binding liquid, and brings the mold up to the desired temperature for casting.

In an experiment lasting just over 150 minutes, about ten molds were processed in sequence from the wax stage until ready for casting. The wax was burned out rather crudely merely by plunging the wax-filled molds into a furnace at its hottest, the wax being allowed to dissipate on the furnace floor. This was untidy, but was done in order that the molds might be broken open to show the fine quality and surface of the cavities formed by the wax. The slurry keeps well and will remain in workable condition for prolonged periods provided that it is kept away from any alkaline influence.

Ministry of Health, 41 Tothill Street, London S.W.1, England

### A comparison of the rest vertical dimension of the face as determined clinically and electromyographically

Mark Roberts. Northwest. Univ. Bul. 60:41-44 Spring 1960

This study was undertaken: (1) to compare the rest vertical dimension of the face as determined clinically and electromyographically, (2) to compare the degree of variability in establishing the rest vertical dimension of the face electromyographically, using the crystograph unit and the electronic integrator unit, and (3) to compare the rest vertical dimension of the face established in and out of the cephalostat. The material con-

sisted of 12 edentulous patients selected at random by an instructor. The results obtained suggest the following conclusions:

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1. A difference was noted to exist between the rest vertical dimension of the face established clinically and the rest vertical dimension established electromyographically. This mean difference was 3.1 mm. with a standard deviation of 1.6 mm. It was not possible to determine which of the two rest vertical dimensions was the more accurate one to be used in the construction of upper and lower complete dentures.

2. The method utilizing the electronic integrator was found to be more objective than the method using the crystograph unit in measuring the total electrical output of the mandibular musculature. The electromyograph used in conjunction with the electronic integrator shows promise of having clinical application in establishing the rest vertical dimension of the face of edentulous patients.

There was no significant difference between the rest vertical dimension of the face established in and out of the cephalostat.

Northwestern University Dental School, 309 East Chicago Avenue, Chicago, Ill.

### Clinical observations on a new denture adhesive

Robert E. Herlands, Austin H. Kutscher, John J. Lucca, Edward V. Zegarelli, James L. Mercadante and Norman Roland. *J.Pros.Den.* 10:278-283 March-April 1960

Two new denture adhesives (Orahesive paste and Orahesive powder, available from E. R. Squibb & Sons) were compared with a control adhesive powder of pure gum karaya in 60 edentulous patients. The new paste adhesive is composed of gelatin, pectin, carboxymethylcellulose, and Plastibase (a mineral oil-polyethylene vehicle). The new powder adhesive is composed of the same three powder ingredients, but the Plastibase vehicle is omitted.

The adhesive paste was applied to the dry denture from the tube, and spread over the inside of the border of the dentures with the finger. The denture powders were applied liberally to the wet denture. The dentures were inserted in the

mouth and pressed firmly against the tissue with closing pressure. The adhesives were allowed several minutes to "gel" before the patient ate or drank. The order of use of the three adhesives for each patient was randomized. Each patient received all three adhesives. When each patient returned to the clinic, he was asked to report on the effects of the adhesives. The following results were noted:

- More patients (30) preferred the experimental paste adhesive than either the control gum karaya (13) or the experimental adhesive powder (12) in terms of duration of firm retention. Five patients found no difference among the three adhesives.
- 2. More patients (29.5) preferred the experimental adhesive paste than either the control gum karaya (13) or the experimental adhesive powder (14.5) in terms of degree of retention during normal activity and function. Three patients found no difference between the adhesives tested.
- 3. More patients (22) found the experimental adhesive paste unpleasant than either the control gum karaya (7) or the experimental adhesive powder (7). Twenty-four patients found no difference as to unpleasantness among the three adhesives.

No side reactions were observed in any patient. 630 West 168th Street, New York 32, N.Y.

### The form and size of edentulous jaws studied with respect to the design of standard trays for taking impressions of edentulous jaws

Göte Nyquist. Svensk Tandlak.Tskr. 52:381-392 Aug. 1959

Measurements were made on the casts of 192 edentulous jaws. On the basis of the standard dimensions and tolerances so obtained, a new series of standard trays for taking impressions of edentulous jaws was designed.

The new trays are designed for two palatal depths and are asymmetrical, the right side being wider at the extreme dorsal part than the left side.

Tests indicate that trays in the new series fit better than trays previously used. The superiority of fit is particularly significant in the palatal vault.

Royal School of Dentistry, Umeå 2, Sweden

## Principles, technics and applicability of implant denture construction

Horst Uhlig. Deut. Zahnärzte Kal. 19:1-19, 1960

In prosthodontic practice, two specific clinical situations may be encountered in which the insertion of implant dentures should be considered as a highly probable solution of extremely difficult problems. The conditions in which the insertion of implant dentures may be indicated are as follows:

 When the edentulous lower jaw shows an almost completely absorbed alveolar crest which cannot provide adequate fixation or stabilization of the customary complete dentures.

2. When a unilaterally or bilaterally shortened upper or lower jaw with a mutilated dentition would require the use of a heterogeneous, and therefore complicated, technic to provide sufficient fixation and stabilization for the partial dentures which have to be retained partly by abutment teeth and partly by the oral mucosa.

For the construction of implant dentures, Wiptam alloy (chromium-cobalt-molybdenum) has been used clinically and experimentally at the Prosthodontic Clinic of the University of Kiel, Germany.

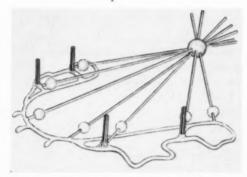


Figure 1 Schematic drawing of a typical lower implant

Figure 2 Implant after Prussian blue reaction in gelatin bath



After routine casting of the implant structures, the entire surface has to be sandblasted and polished electrolytically.

The degree of resistance to postinsertion corrosion of every implant structure was determined by using the negative Prussian blue reaction test in a bath of gelatin.

Because the resistance of all cast alloys to pressure of any kind appeared to be unsatisfactory, the construction of relatively strong denture-supporting pivots had been considered. However, the insertion of implants with such pivots would require a comparatively extensive surgical perforation of the alveolar process and the soft oral tissues. In the majority of patients this procedure is contraindicated. Experience proved that cold-cast pivots of smaller dimensions attaching the dentures to the inserted implant possess sufficient mechanical properties to be used successfully in most instances.

Soldering should be avoided because it produces instability against corrosion. The use of screws, rivets or welding also fails to provide the required resistance to corrosion. The casting of a wire pivot (Wiptam post), 12 mm. long and 1.7 mm. wide is recommended. Cannulas, closed on one side, are positioned in the denture, and fixed accurately with model wire on the plaster cast. The bars, designed to resist pressure, attach to

Figure 3 Parts of implant made of Wiptam alloy. Left = model pin. Center = fixation pivot. Right = denture cannula



the tissue-anchored implant and should be in an area which will not be in contact with the sutures. Otherwise, the healing of the mucoperiosteal flaps would be endangered. The design of the implant structure must permit preserving the mental foramen and accurate fixation to the bone.

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In spite of the reduction of the dimensions of the bars attached to the implant structure, in several instances these bars became separated probably through interference with the muscle insertion in the sublingual region and the orbicularis oris. For the past three years, all subperiosteal implants inserted in the molar region were significantly reduced, with only two pivots fixed with a splinted bar over the mucosa. The impressions were made either with Kerr or Cardex materials. Before an impression is taken grooves are made in the alveolar bone with a round bur according to the anatomic contours and the transverse bar. This procedure facilitates an accurate design and model pattern of the implant as well as a favorable resting position of the tissue anchorage, favoring fixation and healing of the mucoperiosteal flaps.

The insertion of the implants usually is performed from three to four weeks after the initial impression is taken. In the prosthetic restoration of a partly edentulous jaw by implant denture service, the denture must be clasped to a sufficient number of healthy abutment teeth. In these instances, the implant will function as a support of the denture rather than being the main anchorage.

The insertion of implant dentures necessarily must produce the creation of certain, fortunately small lesions in the oral tissues. Tissue reactions to inserted implants (foreign body reactions) are in fact similar to those occurring as mucosal affections beneath dentures, as gingival inflammation after insertion of crowns and bridges or as periodontal inflammation around teeth used as abutments.

Roentgenographic and histologic investigations of the tissues adjacent to an inserted implant demonstrated that in the course of time the surface layer of the alveolar bone was absorbed around the meshwork, and became gradually replaced by fibrous tissue. In regard to adhesion and retention, the positional stability of the implant did not change significantly.

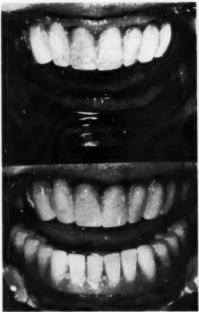
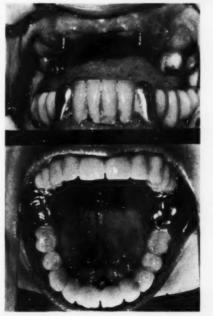


Figure 4 Complete implant dentures. Above = upper denture inserted; lower implant fixed by a bar above the oral mucosa. Below = both dentures inserted

Figure 5 Design of a small implant for a partial denture



Figure 6 Inserted implant bridge



Occasionally, parts of the meshwork may become detached from the implant structure, thereby penetrating into the oral cavity. The causes for such failures may be as follows:

- The implant primarily did not coincide with the anatomic condition of the surface of the bone.
   This may be due to distorted impressions, incorrect representation of the surface of the bone in the model or insufficient technics in implant construction or insertion.
- The implant interfered unfavorably with the muscle insertion or with the newly formed tissue.
- The implant was inserted into an inadequately prepared (absorbed) alveolar crest.
- 4. The implant had enlarged the fibrous sheath, especially that surrounding the inserted structure, which served as anchorage for complete dentures in patients with extremely narrow jaws. This may promote infection in the adjacent tissues.

Examinations carried out with a self-registering dynamometer (ergograph) showed that complete dentures supported by implants functioned almost as efficiently as natural teeth, although a period of adaption is required. The fibrous sheath around the inserted implants is not as sensitive as the periodontium.

The possibility of inserting implant dentures is an eventful addition to the prosthetic armamentarium, and success depends on the knowledge and responsibility of the dentist because there exists no clear-cut indication for this method.

Schillerstrasse 19, Kiel, Germany

### Influence of artificial tooth forms on bone deformation beneath complete dentures

John J. Sharry, Harold C. Askey and Heinz Hoyer. *J.D.Res.* 39:253-266 March–April 1960

This study was undertaken to ascertain qualitatively whether the nonanatomic or anatomic form of artificial teeth transmitted more energy to the underlying bone. Nonanatomic teeth have no interdigitating cusps and do not interfere with

free movements in lateral excursions of the mandible; proponents of such teeth claim they are gentler to underlying structures.

Two sets of artificial dentures were constructed for 18 human edentulous skulls. The dentures were similar in all respects, except that the posterior teeth of one set had anatomic teeth and the posterior teeth of the other possessed nonanatomic teeth.

The brittle-coating technic developed by De-Forest and Ellis (1940) was used to demonstrate deformation patterns in bone. Strain-sensitive lacquer was sprayed on the skulls. The skulls with the dentures inserted were mounted on a testing platform and 6-kg. loads (simulating muscle pull) were applied while the mandible was moved into lateral and protrusive positions. The resulting deformation patterns were identified by brushing an electrolyte over the surface of the skull and then wiping off the excess; an electrically charged white powder was blown over the surface, and the powder piled up on the electrolyte to produce a white-on-black pattern. Patterns were compared for the two sets of dentures after static loading, the anatomic forms in excursion and static loading, and the nonanatomic forms in excursion. The following results were noted:

- 1. The anatomic tooth forms apparently caused more bone deformation over a larger area than did the nonanatomic forms.
- Heavy bone structure seemed to be more resistant to deformation per unit force than average or light bone structure.
- The stress patterns under dentures were not limited to the denture-bearing area but were widely distributed. Sometimes they appeared on the zygomatic processes, medial wall of the orbit and nasal bones.
- 4. The foramens seemed to be the local areas where deformation occurred readily.

Exactly how much deformation occurs under various tooth forms can be determined by the use of strain gauges in those areas suggested by this study, which has afforded a gross estimate of difference

School of Dentistry, University of Alabama, Birmingham, Ala.



### Case records of the Massachusetts General Hospital

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Benjamin Castleman. New England J.Med. 262:776-779 April 14, 1960

A 36 year old woman entered the hospital because of swelling of the mandible. All her teeth had been extracted six years previously. Three months before admission she noticed a small "sore" on the alveolar border of the mandible when the lower denture was inserted. Subsequently, the lesion gradually increased in size to the point that she was unable to insert the denture.

Roentgenograms of the mandible revealed a large, cystlike structure to the left of the symphysis menti. The lesion was smooth in outline and was covered by a thin calcific ring anteriorly. The radiolucent lesion was about 4 cm. long and 3 cm. deep.

The preoperative diagnosis was an odontogenic cyst. At operation the mucosa was incised and a good cleavage plane obtained, but unfortunately the tumor was pierced, and clear, amber fluid escaped from it. This occurrence confirmed the diagnosis of a cystic lesion, which was in the midline, from bicuspid to bicuspid region. After the wall of the cyst was removed, it was noted that the mandible had been expanded lingually and that it was necessary to remove some of the anterior part of the mandible to close the defect. The cyst had a smooth wall, and there seemed to be no penetration of bone because the cyst peeled away easily from the bone. Examination of the wall of the cyst revealed that was a characteristic ameloblastoma, adamantinoma. The tumor showed the classic enamel origin, with beginning keratinization. This was a midline ameloblastoma, an exceedingly rare entity.

Massachusetts General Hospital, Boston, Mass.

### A case of scurvy

Adrian Cowan. Irish D.Rev. 6:46-47 April 1960

A small, thin, 29 year old waiter was referred to the author in the periodontal department of a hospital in Dublin. The patient walked slowly with head down and shoulders drooping. His hair was lank, his face thin, pinched and pale, and he answered questions slowly and feebly. The whole picture suggested an advanced chronic illness.

The patient's teeth had been loose and the gingivae bleeding, for some six months. This condition gradually worsened, and the patient had been treated at several hospitals but without improvement. He had been existing on soft bread and tea for several months because the loose teeth and pain prevented proper mastication.

The gingivae were greatly hypertrophied in both jaws, covering more than a third of the crowns of incisors, and bulging labially and lingually. The marginal gingiva was shiny maroon to blue in color. Ulcers with white slough marked where the upper incisors had traumatized the gingiva around the lower incisors. The free margin of the gingiva was separated widely from the teeth like a platform, and bled at the slightest touch. The teeth were elongated, filthy and extremely loose, and calculus was heavy. The tongue was bald and smooth and red.

A tentative diagnosis of acute leukemia was made, and a blood examination was ordered. The blood count proved normal, but hematologic examination indicated ascorbic acid deficiency. The author made a general examination of the whole body, and discovered petechiae, bilateral hemarthroses in the knee joints and bruising about both ankles. The diagnosis was corrected to scurvy, with pronounced secondary anemia.

The patient was treated with 1 Gm. ascorbic acid daily, intramuscularly injected. After ten days the gingival swelling had subsided and the patient was well enough to have all his teeth extracted. Healing and bleeding were normal, showing that collagen function had been reestablished. Six months later the patient was well and wearing dentures.

Royal City of Dublin Hospital, Dublin, Ireland

### Burning sensations in the mouth, a symptom of aging

I.A.M.A. 171:1907 Nov. 28, 1959

Q.—A 70 year old woman complains of burning sensations in her mouth, tongue and throat. She lives alone and has few outside interests. She has a cataract of the right eye and pain in the right temporal region. Her home is heated by an open gas burner which is in the living room and has no outside flue. She feels cold most of the time, and the gas burner is on almost continuously. What is the cause of these sensations and what treatment is recommended?

A.—This patient complains of symptoms commonly observed in elderly persons. The pain in the temporal region may be due to neuritis of the sympathetic ganglions of the head or neck and the glossopharyngeal nerve. Proper ventilation of her home is advised, although sensitivity to cold also is common in elderly persons. Treatment should include improvement of diet, more effective heating and ventilation of the house, and an attempt to make her live a more active, less reclusive life.

535 North Dearborn Street, Chicago 10, Ill.

#### Hypertrophy of parotid gland

J.A.M.A. 172:1714 April 9, 1960

Q.—A 51 year old man has noticed a bilateral, generalized enlargement of the parotid glands for at least three years. Palpation does not disclose hardness, pain or evidence of inflammation. The man is tall and of average weight and has enjoyed good general health except for a fractured femur about six years ago. The patient is asymptomatic, except for the change in facial appearance. Before a biopsy is performed on the gland, what other investigative studies should be done?

A.—A patient with a bilateral, generalized enlargement of the parotid glands of three years' duration probably has a benign condition. Chronic inflammation due to stones in both parotid ducts, hypertrophy of salivary glands (Mikulicz's disease) and leukemia could be ruled out by examination of the parotid duct for other glandular involvement and blood studies. Some men who gain weight in middle age tend to have a fatty infiltration in the region of the parotid glands which gives them a "chipmunklike" protuberance in this region. Since, after three years, no masses are felt and the swellings are asymptomatic, no treatment is indicated for this patient.

535 North Dearborn Street, Chicago 10, Ill.

### Unilateral nocturnal salivation

Deut.med.Wschr. 85:283 Feb. 12, 1960

Q.—A 58 year old man with a mild myocarditic defect and an insignificantly increased blood pressure suffers from nocturnal salivation occurring only on the right side of the mouth. According to his dentist's diagnosis there are no tooth defects, diastema, tooth loss or periodontal disease. The patient has consulted a neurologist who found neither a neuritis nor a neurosis. May I have information on the etiology and treatment of unilateral nocturnal salivation?

A.-Unilateral nocturnal ptyalism is a characteristic symptom of second or third stage syphilis. If this disease can be excluded as being the causative factor, the symptom must be of neurogenetic origin. Because local stimuli, according to the dental diagnosis, can be disregarded as factors exerting influences on the salivary glands to excrete excessive amounts of saliva, disturbances of the central nervous system should be suspected. Unilateral, not always nocturnal, ptyalism frequently is associated with encephalomyelopathies or tumors involving the brain, spinal cord or nerves. The only effective treatment is surgical: Leriche's method of severing the connecting fibers between the facial nerve and the auriculotemporal nerve, thereby obstructing the duct of the parotid gland. Although this intervention is minor and can be performed under local anesthesia, the prognosis is not always favorable. Procaine hydrochloride infiltration of the region of the involved salivary gland or glands usually obtains temporary relief.

Cantonal Hospital, Geneva, Switzerland



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### Healing of periapical tissues in human teeth after pulp extirpation and root canal filling

Kinji Fukunaga. Shikwa Gakuho 59:11-32 Oct. 1959

To ascertain the healing process in periapical tissues after treatment of uninfected root canals, the author treated 81 human teeth which had been subject to trauma or early caries. The root canals of all teeth were uninfected. In each tooth, the pulp was removed, the root canals were cleaned and sterilized, and filled either with calcium hydroxide paste, paraformaldehyde, zinc oxide-eugenol or gutta-percha. The treated teeth were divided into three groups, and left in place for 20, 50 and 100 days, respectively, before apicoectomy was performed, and the excised material studied histologically.

The healing processes in periapical tissues after root canal treatment appeared to be of three general kinds: (1) gradual healing of the incidental acute inflammation as a result of the treatment; (2) repair of destruction in the periapical tissues caused by the treatment, by regeneration of the tissues, and (3) closing of the apical foramen.

The repair by regeneration of the periapical tissues occurred in the following ways: (1) repair of the resorbed root surface; (2) regeneration of the periodontal membrane; (3) reappearance of the periodontal space, and (4) proliferation of the alveolar bone.

Apical foramens closed in one of three ways: (1) inside the root canal, (2) at the apex and (3) outside the apical foramen.

Apical foramens were closed either by connective tissues or by proliferation of hard tissues.

Healing of the periapical tissues was promoted by the filling materials used.

Tokyo Dental College, Tokyo, Japan

### Choice of anti-inflammatory agents in root resection

W. H. Hiatt. Oral Surg., Oral Med. & Oral Path. 13:396-400 April 1960

In an experiment designed to test the efficacy of promethazine hydrochloride and parenteral cortisone acetate administered on the day of surgery to control edema, four study groups totaling 228 patients were formed. All patients were subjected to root canal preparation, irrigation and filling performed under a rubber dam. After removal of the dam, apicoectomy or periapical curettage was done.

The 52 patients in Group II received no medication. The 81 patients in Group II received one 25 mg. tablet of promethazine hydrochloride one hour before surgery and a second tablet on retiring the same night. The 24 patients in Group III received 50 mg. of cortisone acetate intramuscularly one hour before surgery. The 71 patients in Group IV received 50 mg. of cortisone acetate intramuscularly plus one 25 mg. tablet of promethazine one hour before surgery, and a second 25 mg. tablet on retiring.

The absence or presence of edema was verified in each patient before and immediately after the surgical procedure, and 24 hours postoperatively. This was not a double blind study. Patients were selected for each category of medication; if medications were contraindicated, the patient then was used as a control.

No significant difference appeared between the incidence of postoperative edema in the control group and in the group receiving only cortisone acetate. (Only 9 of 52 patients given no medication remained free of edema postoperatively; only 6 of 24 patients receiving only cortisone acetate remained free of edema.) Of the 81 patients receiving only promethazine, 26 had no edema. Of the 71 patients receiving both drugs, 37 had no edema.

The incidence of postoperative edema thus was greatly reduced in patients receiving the combination of drugs. Promethazine alone proved efficacious, but less so than the combination of the two drugs. Side effects were absent, except for slight drowsiness produced by promethazine.

1325 East Sixteenth Street, Denver, Colo.



### A case of progressive hemiatrophy presenting with spontaneous fractures of the lower jaw

Paul Bramley and Alec. Forbes. *Brit.M.J.* No. 5184:1476-1478 May 14, 1960

Hemiatrophy is a rare recessive hereditary degeneration, which can affect the skin, connective tissue, muscle, bone and peripheral nerves, and involve many organs and systems of one side of the body. The case reported is believed to be the first in which jaw fractures were caused by progressive facial hemiatrophy. The onset of facial hemiatrophy occurs near adolescence, as in other hereditary atrophic defects.

The patient, a 53 year old woman, had the typical symptoms of facial hemiatrophy, including onset at puberty, scleroderma, seizures, trigeminal neuralgia, muscular spasms, sweating, and slow progression of the disease.

At the age of 49 years, frontal and vertical headaches began. A few months later, momentary jabs of severe pain developed in the right infra-auricular region. Similar pain lasting two to three seconds began in the right cheek and occurred 6 to 150 times a day. Talking and drinking initiated the pain, but there were no trigger points, increased salivation, lacrimation, or swelling of the face. Shortly after this, the patient experienced similar pain in the right side of the lower jaw associated with spasms during which the jaw clenched on the right side spontaneously, sometimes with pain and sometimes without. At other times she would clench the jaw voluntarily when the pain became severe.

On October 12, 1953, after one severe spasm, the pain persisted and her face swelled. A spontaneous fracture of the neck of the right condyloid process was found. It was treated by intermaxillary fixation and healed well. Both jaws were edentulous. The patient could not remem-

ber whether a spontaneous contracture without pain had initiated this fracture. No facial asymmetry then was observed. About this time, numbness of the right side of the lower lip and chin began, and has persisted.

On June 12, 1957, while resting in a deck chair, the patient had a severe muscular spasm, after which the right angle of her mandible was found to be fractured. A biopsy of bone taken from the fracture site showed no pathologic changes. The fracture was treated as before, and united satisfactorily. On both occasions in which spontaneous fracture of the mandible occurred, the patient was wearing upper and lower complete dentures.

Spontaneous fractures of the jaw caused by progressive hemiatrophy are believed not to have been previously reported. The underlying factor probably was intense spasm of the right side of the face associated with trigeminal neuralgia acting on a jaw which had been weakened by hemiatrophy.

South Devon and East Cornwall Hospital, Plymouth, Devonshire, England

# A comparative survey of jaw fractures during the years 1948-1958

Dorrit Lindström. Suomen hammaslääk.toim. 56:16-29 March 1960

Of 649 patients with jaw fractures treated at the Department of Dentistry of the University of Helsinki, between 1948 and 1958, a third of the patients were between 21 and 30 years old, and half of the patients lived in cities. July accounted for the largest number of jaw fractures. Fractures of the jaw occurred 5.5 times as often in men as in women. Workers represented the largest vocational group (50 per cent). Fights and physical violence accounted for 36.7 per cent of the total number of jaw fractures; next came traffic accidents (20.8 per cent), and accidents at work (18.6 per cent). Traffic accidents, sports and falls were the most common cause of fractures of the jaw among women, whereas fights and accidents at work involved mainly men.

Fractures of the mandible comprised 84 per cent of the material. The most common complication was brain injury, which occurred twice as often in connection with fractures of the upper than of the lower jaw.

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The results were compared with earlier statistics on jaw fractures in Finland and corresponding data obtained abroad. In the present material, a leveling trend in the age of patients could be observed. Thirty-three per cent of the patients fell in the age group 21 to 30 years old; in earlier Finnish statistics, this was 44 per cent. The ratio among the corresponding women's group has risen from 7 to 15 per cent. The percentage of jaw fractures attributed to fights has fallen from 46 per cent to 36.7 per cent, whereas the percentage attributed to traffic accidents has doubled. Reports from abroad indicate that the percentage of jaw fractures attributed to traffic accidents is strikingly higher than in Finland. However, among child patients in the present group, traffic accidents account for 38 per cent of the jaw fractures.

Department of Dentistry, University of Helsinki, Finland



### Some observations on the subject of roots of teeth retained in the jaws as a result of incomplete exodontia

R. W. Helsham, Austral.D.J. 5:70-77 April 1960

Of 2,000 patients referred for removal of retained roots of teeth, 1,676 patients had retained the roots in their jaws for periods ranging up to 50 years, without symptoms or recognizable pathologic changes.

Eighty-two of the patients complained of pain in the region of the retained roots; in 75 of these patients, the roots were exposed. Acute infection was seen in 16 patients, 15 of whom had roots surrounded by granulation tissue. Sclerosis was evident roentgenographically in 118 patients. Of the 38 cysts found, 20 were related to roots which had remained undiscovered in the mouth, the cysts developing at the apexes. Of the 236 roots associated with granulation regions, only 133 had granulation tissue in the apical region. One patient in four had an associated systemic condition. The survey, however, indicates no evidence for a connection between the presence of retained roots and systemic disease.

From this study the following conclusions were drawn:

- 1. Some roots have nonvital pulps when extraction is attempted, or the pulp is lost or becomes nonvital as a result of the trauma of fracture. Some of these roots become infected immediately and are removed a few days later. Others are loose in the sockets and are exfoliated gradually. The small number of roots with nonvital pulps which remain in the jaw are surrounded by granulation tissue when the tissues heal over them. This region of root retention and newly formed granulation tissue may remain quiescent indefinitely. Clinical evidence shows that acute infection may supervene at any time, probably as a function of the resistance of the patient. Another possibility is that a cyst may form.
- 2. The vast majority of retained roots have a vital pulp when fractured and the pulp may remain vital. The tissues heal over the retained roots. The periodontal membrane extends across the fractured surface until it meets. Cementum then is laid down on the fractured surface. The pulp undergoes metaplasia and cementum is laid down on the pulpal walls, sealing off the dentin. Thus, the condition of the root has been returned to normal. It is sealed off from the mouth, the dentin is covered, and cementum deposition continues externally and internally.
- 3. If the root is exposed to the mouth, its pulp may remain vital for a period. Bacteria may reach the pulp and then it necrotizes. Acute infection may follow. Or, the tissues may heal again, leaving the root just below the surface with a region of granulation tissue surrounding it.

At the time of extraction, there is no method of determining whether the pulp in a retained root will remain vital. Initially, there may be pain or infection. If the pulp in the root is nonvital, acute infection or cyst formation may appear. The

acute infection may not occur until many years later. There is nothing in this study to justify indiscriminately leaving portions of root fractured at extraction.

When a retained root is discovered during roentgenographic examination, the root can be treated individually. Granulation tissue associated with a retained root always can be identified roentgenographically; such granulation tissue indicates a root with nonvital pulp; such a root is dangerous to the patient, and it should be removed.

If the position of the root is such that resorptive processes will expose it, taking into account the age of the patient, the root should be removed. If a root has perforated the bone, and dentures are to be constructed, the root should be removed because the pressure of the denture eventually will cause exposure of the root.

Some patients who have been wearing den-

tures for many years may have deeply buried roots with vital pulps. Some of these patients may have almost a full complement of healthy teeth, with a deeply buried root with vital pulp. Others may have the roots of cuspids and bicuspids high in the alveoli in front of the medial wall of the antrum. These roots never will become exposed. In a similar category are palatal roots of molars high in the antral wall, deeply buried roots of third molars, roots of lower bicuspids below the level of the mental foramen, or roots of molars in the vicinity of the mandibular canal. There is no justification for the routine removal of such roots with vital pulps.

The root judged to be a danger to the patient should be removed. It should be recognized, however, that many roots never will affect the patient; these should be diagnosed as such, and left

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### Clinical evaluation of erythromycin sulfanilamide therapy in oral surgery

Walter Raymond Mourfield, Jr., and John Mallet Barron. J. Tennessee D.A. 40:15-20 Jan. 1960

A controlled clinical investigation of the use of a homogenous mixture of sulfanilamide and micronized erythromycin ethyl succinate for the prevention of postextraction complications was carried out in 537 patients at the University of Tennessee College of Dentistry.

Exactly 1,115 teeth were extracted from 417 patients in the experimental group; 436 teeth were extracted from 120 patients in the control group.

A Powdalator glass tube was used to introduce directly into the extraction wound the following mixture: erythromycin (as erythromycin ethyl succinate), 10 mg.; sulfanilamide crystals, 250 mg.; cyclamate sodium, 6 mg., and saccharin sodium, 0.6 mg.

In some of the experimental patients in whom multiple extractions were made, some of the alveoli were not treated with erythromycin-sulfanilamide, but the extraction or extractions were made in the same patient at the same time as those in which the alveoli were treated with erythromycin-sulfanilamide.

The use of erythromycin-sulfanilamide in the extraction wound reduced the incidence of osteoalveolitis and postextraction cellulitis to 0.46 per cent in 669 extractions, as compared to 16.81 per cent in 446 control extractions in the experimental group and 16.74 per cent in 436 extractions in the control group. The combination of erythromycin and sulfanilamide was found to be 0.72 per cent more effective than the use of erythromycin alone as reported by the authors in 1958 (D.Abs. 4:14 Jan. 1959).

The study showed no contraindications to routine use of erythromycin and sulfanilamide; however, it is suggested that its use be limited to those patients who have no history of hypersensitivity to either erythromycin or the sulfanilamide series.

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### Bone homografts in the surgical treatment of cysts of the jaws and periodontal pockets

Heyman Krømer. *Odont.Tskr.* 68:1-121 March 1960 [in English]

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This study was undertaken (1) to establish to what extent it is possible to graft bone successfully into the jaws of human patients intraorally, and (2) to evaluate the usefulness of bone homografts in this type of oral surgery.

Bone grafting was performed in 40 male and 30 female patients ranging in age from 10 to 59 years. The observation time varied between 1 and 6 years. All patients were examined clinically and roentgenographically after 3, 6 and 12 months, and subsequently once a year.

The bone was obtained from ribs removed in heart operations, from resected femoral heads and from iliac crests. An aqueous solution of thimerosal (1:1,000) was used as the preserving agent for the homogenous bone.

The operative technic consisted of endodontic treatment of the involved teeth, cyst membrane enucleation, curettage or resection of the root tips, and packing of the cavity with bone chips. Peroral antibiotic treatment was instituted either 24 hours prior to operation or on the day of operation, and was continued for 3 to 5 days subsequent to operation.

Only a complete or nearly complete restitutio ad integrum was regarded as a favorable result. Instances in which there was incomplete bone regeneration but with newly formed lamina dura, and those with root resorptions as observed in roentgenograms, were listed as partly favorable. Of the 70 bone grafts, 51 were favorable, 14 were partly favorable, and 5 were failures.

Homogenous bone grafts stored in thimerosal are well-suited for the filling of bone cavities after enucleation of cyst membranes. Communication between the cyst and the oral cavity by way of periodontal pockets constitutes no contraindication for bone grafting. Bone preserved in thimerosal caused no foreign body reaction, and the grafting resulted in undisturbed wound healing. The storage time for bone should not exceed three months.

In the second experiment, 26 patients were operated on for 30 infrabony pockets. The observation time was from 1 to 3½ years. The operative technic consisted of incision, reflection of a mucoperiosteal flap and curettage, and irrigation with isotonic sodium chloride solution. The region then was packed with grain-sized cancellous bone chips from bone identical to that heretofore described. The flap was replaced and sutured, and surgical cement was inserted into the interproximal space. The antibiotic treatment was identical to that described in the first experiment.

Of the 30 operations, 23 were deemed successful (pocket depth of 3 mm. or less), 4 were deemed partly favorable (pocket depth of 4 and 5 mm.), and 3 were deemed failures (pocket depth of 6 mm. or more).

The amount of bone regeneration that occurred in a number of the successful operations indicated a beneficial effect of bone grafting in the treatment of periodontal pockets. The use of tiny cancellous bone chips was advantageous since: (1) any type of bone lesion can be filled; (2) the speed and amount of vascular penetration are enhanced, and thus the chances of successful antibiotic therapy are increased, and (3) a postoperative shrinkage of the blood clot with exposure of the graft may necessitate the removal of the superficial bone chips only.

A third experiment was concerned with the healing stages of bone grafts in periodontal pockets artificially produced in dogs. Fourteen pockets were grafted and two pockets were used as controls (coagulation time only). From histologic observations, it was concluded that the epithelization of periodontal pockets deeper than 5 mm.

in the dog was not completed in the course of 56 days. However, complete epithelization was observed after 91 days. Absolute sterility of the bone graft and of the host bed did not seem to be a necessary requirement for successful bone grafting in the periodontium of the dog. Reattachment can be attained in incompletely epithelized pockets by means of combining the flap operation with curettage, with and without bone grafting. Under favorable conditions, the complete removal of pocket epithelium may not be necessary for reattachment.

The study is illustrated with 65 figures, and the bibliography lists 84 references.

Institute for Experimental Medical Research, University of Oslo, Norway

### Trigeminal neuralgia

S. L. Drummond-Jackson. Brit.J.Clin.Prac. 13:867-871 Dec. 1959

Trigeminal neuralgia is rare, the cause unknown, the development slow and sporadic, the course unpredictable, the diagnosis difficult, the suffering dreadful and the treatment fraught with hazard. Yet if dental teaching, at present inadequate, could ensure that all instances of trigeminal neuralgia could be recognized at an early stage and referred to a specialist, there is good reason to hope that a maxillary terminal neuroma may without difficulty be shown to be the cause. If so, simple treatment at this early stage will effect a permanent cure.

Trigeminal neuralgia might better be termed "maxillary neuralgia," because the ophthalmic branch of the trigeminal nerve rarely is involved.

Too often at present, teeth are unnecessarily sacrificed. The first symptoms usually indicate a dental condition, and rarely is a patient with trigeminal neuralgia referred to the neurologist before attempts have been made by the dentist to remove a suspected cause. Teeth remaining in the region of distribution of the nerve are progressively suspected and extracted. Accepted dental teaching allows the region to be pronounced clear of suspicion when roentgenographic evidence discloses no hidden tooth roots or potential source of infection.

Though the cause is still classed as unknown, there is little doubt that it is in the maxillary innervation. Though the cause is sought as a hidden tooth root, it is the peripheral nerve ending within that root which is the possible source of the trouble. The possibility of a postextraction neuroma resulting from a residual nerve is high. Though individual neuromata no doubt could be located by layered roentgenograms, a simpler method is needed to determine the approximate location. If, for example, a starting point in the distribution of the posterior superior dental nerve is suspected, and the patient is seen at an early stage of the disease, only a few minutes are required to anesthetize the nerve at its exit from the maxilla, to stimulate the trigger stimulators which are known to set off the pain, and to confirm whether the cause of the neuralgia is in this nerve.

If the cause is thus located, temporary relief can be given by a simple operation. The posterior superior dental nerve leaves the maxilla by a single foramen, or a close group of smaller foramens, seldom higher than 30 mm. above or more than 6 mm. posterior to the midbuccal crest of the alveolus of the third molar. If this tooth is absent, the position must be assessed by the estimated measurements allowing for bone resorption, or by transferred triangulation if the third molar of the opposite side is present. The nerve may be severed at its exit from the maxilla by means of a curved subperiosteal scraper, and beveled to enable close contact with the bone to be maintained throughout.

Permanent relief is secured by preventing regeneration of the nerve. One simple method may be the insertion of a small curved plate to cover the maxillary exit. Where the affected nerve lies within a channel, as does the mandibular nerve, a section can be replaced by a metal or plastic implant. Where there is no channel, a transverse plate should be effective.

Teeth never should be removed merely on suspicion. In many instances, it is less of a hardship to a patient to have the maxillary nerve severed, and rejunction prevented, than to have a valuable molar removed.

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Anesthesia and analgesia

#### Anesthesia in dentistry

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Fritz Schön, Deut.zahnärztl.Zschr. 15:329-341 Feb. 1, 1960

In the field of dentistry, anesthesia has assumed an important position. The widespread use of local anesthetics for other than purely surgical procedures indicates sufficiently the adaptability of these anesthetic agents to every dental procedure.

The development of anesthesia may be divided into three historical periods:

- 1. The period of "discoveries," during which the need for anesthetic and analgesic agents became evident but in which the acceptance of newly developed anesthetics was a matter of controversy.
- 2. The period of "technical advances," characterized by profound progress in surgical methods and anesthetic technics. At this period, however, the anesthetist played a secondary role in every surgical intervention. The administration of anesthetics during surgery then was performed by a resident physician or a nurse under the supervision of the surgeon.
- 3. The period of "physiological" anesthesia, initiated in most Anglo-Saxon countries (especially the United States) about 25 years ago. It began in Europe after World War II by cooperation between the dental and medical professions with prominent Austrian, German and Swiss anesthesiologists (Kilian, Frey, Zürn, Mayrhofer, Hügin, and others).

The perfection of surgical technics required the development of anesthesia methods which lowered the hazards of surgical interventions. Postoperative complications and even deaths were blamed on either the properties of the anesthetic used or the anesthetic method employed. Today, neither the surgeon nor the anesthetist but the patient is considered to be the principal person in

any surgical procedure. Advanced knowledge of physiology and pathophysiology is and will be the basis of indication for and administration of local and general anesthesia in dentistry and medicine.

Postoperative deaths after local anesthesia are comparatively rare. Comparative statistics of deaths associated with local anesthesia administered in dental and medical practice reveal the following data: (1) Furstenberg and co-workers reported that after 30,000 tonsillectomies performed under cocaine hydrochloride anesthesia, three deaths occurred (0.010 per cent); (2) Ireland, Ferguson and Stark reported that after 39,298 otorhinolaryngologic (surgical) interventions performed under cocaine hydrochloride or tetracaine hydrochloride anesthesia, seven deaths occurred (0.018 per cent); (3) Schindler reported that after 22,251 gastroscopies performed under cocaine hydrochloride or tetracaine hydrochloride anesthesia, three deaths occurred (0.013 per cent); (4) Williams reported that after 6,378 otolaryngologic (surgical) interventions performed under cocaine hydrochloride anesthesia, two deaths occurred; (5) Beecher and Todd reported that after 7,600 general surgical interventions performed under regional or topical anesthesia (specific anesthetics used were not mentioned), one death occurred (0.01 per cent); (6) Seldin and Recant reported that after more than 90,000,000 dental procedures of all kinds performed under local anesthesia (mainly procaine hydrochloride) two deaths occurred (0.00002 per cent), and (7) Seldin reported that after 4,244,449 oral surgical interventions performed under local anesthesia (specific anesthetics used were not mentioned), three deaths occurred (0.00007 per cent).

In spite of the demonstrated safety of local anesthesia used in dental practice, dentists should be aware of the fact that no "small" anesthesia and no absolutely "harmless" anesthesia exists. Most dental procedures performed at the dental office require relatively short duration anesthesia (surface anesthesia) but the operative field lies near the respiratory tract and the hazards of obstructing the air passage and causing serious reflex reactions are always present.

Postanesthetic complication should be prevented by using psychologic, mechanical-physical or therapeutic measures.

Premedication with sedatives and ataraxics in preparation for anesthesia at the dental office should be avoided. These drastic measures must be limited to use in patients who are extremely excited, anxious and fearful, making routine management impossible. Premedication, especially with morphine combinations, renders such patients more controllable, reduces the amount of the anesthetic required and places the patient in an agreeable, receptive frame of mind for the dental procedure contemplated. Premedication also alleviates the immediate postoperative pain. At the dental office, however, premedication is not essential and should be employed only in instances in which it is absolutely necessary. The shortness of most dental procedures and the fact that the majority of patients are ambulatory soon after the procedure is completed make routine administration of premedicating agents undesir-

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#### 'Hypnosis,' analgesia, and the placebo effect

Theodore X. Barber. J.A.M.A. 172:680-683 Feb. 13, 1960

Although hypnotic technics gradually are finding a useful place in the anesthesiologist's armamentarium (especially in patients in whom chemical analgesics are contraindicated), the means by which "mere words" spoken by one person to another are able to exert an analgesic effect have been left unexplained, or have been discussed in terms of concepts which themselves are in need of explanation. Nevertheless, sufficient data have been accumulated to delineate two factors which are responsible for the effectiveness of hypnotic methods in minimizing pain. One of these factors is similar to a placebo effect; the other resembles the mode of action of morphine.

It has not been demonstrated experimentally that hypnotic procedures offer more satisfactory relief from pain than do placebos. The placebo effect has been reported to give satisfactory relief from severe postoperative wound pain in about 30 per cent of patients. Estimates as to the num-

ber of persons who manifest or experience such phenomena as hypnotically induced analgesia, age regression, hallucination and amnesia range from 5 to 25 per cent of the population.

Young noted (1928) that all his good hypnotic subjects showed one or more of the following characteristics long before they were "hypnotized": "deep abstraction, reverie amounting almost to ecstasy, putting oneself to sleep at will, actually hypnotizing one's self." Similarly, Barber found (1957, 1958, 1959) that subjects who are able to experience such phenomena as hypnotic analgesia or hypnotic hallucination also are able to carry out a similar type of behavior without a hypnotic induction procedure. For example, these subjects typically report that they do not require a local anesthetic for dental work; prior to participating in hypnotic experiments, they had discovered that by thinking about something pleasant and inhibiting all thoughts concerning the dental situation they could undergo dental procedures without hypnosis. Apparently, these persons are able to carry out the essential behavior involved in "hypnosis"-to become relatively inattentive and unresponsive to selected stimuliwith or without a formal hypnotic procedure.

In general, studies of the placebo effect suggest that the reactor to placebos is responding to a "drug" which he believes has curative properties. Similarly, hypnotic analgesia is partly a function of the patient's conviction that the therapist-hypnotist will relieve his pain.

It has generally been assumed that hypnotic analgesia has little, if anything, in common with the relief of pain effected by administration of morphine. However, these seemingly diverse analgesic procedures possess common characteristics: in both, pain as a sensation is not necessarily altered; in both, discomfort and suffering are minimized or eliminated; in both, the relief of suffering appears to be secondary to an alteration in the patient's concern with, attention to, or anxiety about the nociceptive stimulation.

Narcotics and hypnotic procedures do not necessarily affect the sensation of pain per se; however, by mitigating anxiety and by inducing contentment and a "bemused state," discomfort and suffering are alleviated and the pain sensation may appear to be suppressed.

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### Psychophysiology of hypnosis

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Louis J. West. J.A.M.A. 172:672-675 Feb. 13, 1960

Psychophysiologically, the hypnotic trance may be defined as a controlled dissociated state. This state of altered awareness is maintained through "parassociative" mechanisms which scan and screen information and regulate the sphere of awareness moment by moment. Only a minute portion of total available information-from the external environment, from within the body, and from the brain's own enormous stores-can be held in awareness at any given time.

The ascending reticular activating system integrates the relationship between sensory information and awareness. When there occurs a pronounced narrowing of focus of awareness on a particular aspect of reality, to the exclusion of much of the rest (as in the initiation of the hypnotic trance), then sensory data (verbal suggestions) taken in through an open channel (rapport) become effective because they are not subjected to ordinary reality-testing.

The experienced hypnotist will recognize two psychophysiologic situations as the most probable concomitants for the two characteristic clinical situations in which hypnosis may be induced easily: (1) the gentle, monotonous, objectfocused laboratory technic, and (2) the emotionladen, high stimulus-input stage technic. The first is near the hypnagogic point with a low level of arousal but an even lower level of effective input; the second is near the point of spontaneous dissociative phenomena under conditions of great arousal and impaired effective input, due to the input overload's figuratively "jamming the circuits."

The mechanisms mediated by the ascending reticular activating system probably involve the thalamocortical projection system, corticofugal systems both excitatory and inhibitory, and other integrated regulatory systems known to function in connection with the ascending reticular activating system.

The frame of reference provided by this theory permits a better understanding of the relationship between the actions of various drugs and the induction and maintenance of the hypnotic state. No drug can be evaluated for its adjunctive value

in the induction of hypnosis without first considering the psychophysiologic state of the subject at the time.

The patient who is chronically anxious may be rendered distinctly more accessible to hypnosis by the use of a drug which decreases central autonomic reactivity while maintaining a good cortical arousal pattern. The author has observed that phenothiazine derivatives can be helpful in such instances, whereas phenobarbital (which depresses arousal) usually is not. On the other hand, in a patient in whom tension is prominent, with manifestations chiefly in the musculoskeletal system, a barbiturate or meprobamate preparation may be helpful. Although such stimulants as amphetamine and methylphenidate have seemed to make hypnosis more difficult to induce in certain patients, they may help, when combined with barbiturates, to ease the induction of hypnosis in tense, depressed patients.

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### **Etymology of terms of interest** to the anesthetist

Kurt F. Schmidt and Nicholas M. Greene. Anesth.& Analg. 39:167-174 March-April 1960

An interesting and rewarding method of studying the background of anesthesia is to study the derivation of words and phrases used by persent-day anesthetists.

Analgesia is composed of the Greek an meaning "no" and algesis which means "sensation of pain."

Anesthesia is derived from the Greek an meaning "no" and aisthesis meaning "feeling" or "sensation." The term "anesthesia," however, was not created by Oliver Wendell Holmes, as frequently is believed, but has been in use since the first century B.C. in its present sense. Dr. Holmes does deserve credit for applying the term to Dr. Morton's discovery. The transition from "anaesthesia" used by Holmes to "anesthesia" in use today corresponds to the gradual disappearance of ae from the American languager over the last 100 years. In England, the substitution of e for ae has not been as complete or consistent as in America, and in the British literature the ae is retained in

such terms as anaemia, haemorrhage and anaesthesia but is abandoned in ether, hyena, phenomenon, economy and pedagogy.

Asphyxia is derived from the Greek and represents a combination of the negating a and sphyxis meaning "pulse." Asphyxia in the sense of suffocation was introduced during the nineteenth century.

Hypnotic is derived from Hypnos, the Greek god of sleep. Hypnos was the son of Nyx, the goddess of night and the brother of Thanatos, the god of death. Hypnos had a son, Morpheus, the god of dreams, from whose name the term "morphine" was derived.

Pain is derived from the Latin poena, a word originally indicating both pain and punishment.

Surgeon is an adaptation of the old French word serurgien or cirurgien which, via Latin, comes from the Greek cheirurgos, compounded from cheir meaning "hand" and "ergon" meaning "work." Related words containing the root cheir are chiropodist and chiropractor.

Other words whose etymology is traced include alcohol, aorta, atropine, barbiturate, belladonna, canister, carotid, chemical, cyclopropane, ether, euphoria, heroin, parasympathetic, sacrum, sciatic, scopolamine, shock, spine, splanchnic, subarachnoid, succinylcholine, sympathetics, toxic, trachea and vagus.

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#### Hydroxydione anesthesia

J. E. Rollenhagen. Deut.med.J. 10:310-313 June 28, 1959

Hydroxydione has proved a valuable basic anesthetic for oral surgery performed in elderly patients in whom cardiac or circulatory complications are to be expected. The drug has hypnotic effects; the patients sleep quietly, as in normal sleep, but sleep is induced more slowly and evenly than with barbiturates.

Increasing the dose during anesthesia prolongs but does not strengthen the anesthetic effect. Combinations with barbiturates are contraindicated because using such mixtures increases the danger of respiratory depression. Hydroxydione can be used safely in patients with hepatic or renal disorders. Cytochrome C and cocarboxylase are effective antidotes.

The use of hydroxydione is indicated in patients with cardiac and circulatory insufficiency, diabetes, ileus and peritonitis. Because the drug is partly broken down in the liver and is excreted through the kidneys, careful dosing is necessary in patients with hepatic and renal conditions. Hydroxydione is best when given in a 2 per cent procaine hydrochloride solution with a 10 per cent isotonic sodium chloride solution as a solvent. Premedication with meperidine, atropine, promethazine and an antihistaminic is recom-

Because hydroxydione should be used only as a basic anesthetic, anesthesia can be continued with ether or nitrous oxide.

The patients usually awaken soon after the operation, and then often sleep for another two or three hours.

With this anesthetic agent, the requirements for analgesics in the first 12 to 24 postoperative hours are greatly reduced.

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### Differential physical-chemical and neuropharmacologic properties of local anesthetic agents

A. P. Truant and B. Takman. Anesth. & Analg. 38:478-484 Nov.-Dec. 1959

In the literature on local anesthetic agents, physiochemical data are sparse. In this study, certain physiochemical properties of procaine. lidocaine, hexylcaine, tetracaine, dibucaine and cocaine were studied and compared with the intrinsic local anesthetic potencies of these drugs. The findings are tabulated. Some relatively obscure or less studied pharmacological and physiochemical properties of local anesthetic agents are reviewed.

The findings have clinical relevance with respect to certain parameters of anesthesia, especially duration. The duration of anesthesia obtained with tetracaine can be attributed to this drug's high binding affinity for nerve tissue components, and to the drug's intrinsic potency. With lidocaine, the relatively long duration of anesthesia in such procedures as mandibular, brachial plexus and extradural blocks is due primarily to a relatively high distribution of lidocaine in the neural and extraneural tissues because of the drug's slower absorption from certain sites of injection.

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Kinetic experiments on the nerve demonstrated that tetracaine, hexylcaine and propoxycaine, unlike procaine and lidocaine, caused a delay in the recovery process of the action potential. This effect is correlated with the binding characteristics of the agents.

Tetracaine and dibucaine are bound to the tissue homogenates to a much greater extent than procaine or lidocaine. Dibucaine has a twofold to fivefold greater binding affinity than tetracaine.

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### Intravenous premedication in dentistry

Richard J. Burch, William D. Riley, Jr., Harcourt M. Stebbins and James R. Smith. J.Oral Surg., Anesth. & Hosp. D. Serv. 18:299-304 July 1960

In May 1956 the oral surgery service of Lackland Air Force Hospital began a project designed to develop a safe, easy, practical premedication procedure that would not consume too much time. This is a preliminary report. The methods reported have been used successfully in about 4,800 instances during the period from May 1956 through February 1958. No premedicated patient has fainted or exhibited other untoward reaction during anesthesia and surgery. As a contrast, about 12.5 per cent of unpremedicated patients exhibited untoward reactions.

Intravenous premedication was selected for the preliminary study because effects could be evaluated immediately and, generally, these effects would more quickly "wear off" than with other methods. After premedication, operations were performed with patients under local anesthesia, using lidocaine 2 per cent with epinephrine 1:50,000. Most of the patients were basic air-

men between 17½ and 22 years old. Operations ranged from single tooth extractions to full-mouth odontectomies, removal of roots in the antrum, incision and drainage, correction of dislocated jaws, and crown and bridge procedures. The following drugs and combinations, and average dosages, were used:

- Pentobarbital sodium alone, average dose of 145 mg.
  - 2. Secobarbital sodium alone, 67 mg.
- Secobarbital sodium with meperidine hydrochloride, 50 mg. of each agent.
- 4. Secobarbital sodium with morphine sulfate and atropine sulfate; outpatients were given 50 mg. of secobarbital and % grain (8 mg.) morphine sulfate with ½00 grain (0.2 mg.) atropine sulfate. Most inpatients received 75 mg. secobarbital with % grain morphine and ½25 grain (0.275 mg.) atropine. This combination of drugs was used in over 4,500 patients. Notable advantages over the preceding types of premedication, from the dentist's standpoint, were the elimination of saliva and the obtunding of the pharyngeal reflexes.
- 5. Thiopental sodium with morphine sulfate and atropine sulfate. The thiopental sodium was made up in 4 per cent solution and usually given in 80 mg, doses with morphine % grain and atropine ½25 grain.

The barbiturate was given first when a combination of drugs was administered, because any tendency to nausea from morphine is lessened by giving the barbiturate first. The injection was made slowly. During intravenous premedication the patient was constantly reassured by the dentist.

In the preliminary study, the most satisfactory combination of drugs proved to be secobarbital sodium-morphine sulfate-atropine sulfate for longer operations, and thiopental sodium-morphine sulfate-atropine sulfate for shorter procedures.

Practitioners should pursue a short postgraduate course of instruction under the auspices of an accredited dental school before practicing this type of premedication.

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# Diagnostic potentialities and limitations of maxillofacial angiography with oxygen and carbon dioxide contrast mediums

H. W. Schmidt and F. J. Deufmann. Fortschr.Röntgenstr.Nuklearmed. 91:25-34 Jan. 1960

Angiography of maxillofacial arteries has been used successfully for many years at the First Medical Clinic of the Medical Academy of Düsseldorf, Germany.

Use of this technic, however, is contraindicated in dental or oral surgical patients suspected of being sensitive to iodine. Another disadvantage is the fact that details of pathologic changes may be obscured by the radiopaque medium. Gas arteriography, which is well tolerated by the majority of patients, produces the finest angiographic details without causing adverse reactions in patients. When an artery on the involved side of the face cannot be palpated, injection of the contralateral artery usually succeeds in getting the gas in retrograde fashion to the desired location.

Previously, percutaneous injection of carbon dioxide was attempted. Pure oxygen, however, proved to be superior because of the significantly decreased rate of absorption. Therefore, angiography can be performed at a rather leisurely rate, and no specific equipment is necessary to take serial roentgenograms. Initial exposures can be made after injection of 40 cc. pure oxygen, and final filming may take place after an additional dose of 40 cc.

A series of 55 case reports demonstrated that the procedure causes no side effects or arterial spasms. By use of pure oxygen, previously unrecognized areas of vascular calcification appear clearly. Arterial occlusion gives an easily recognizable picture, with the gas obtaining visualization of the peripheral segment. In instances of fresh embolism, however, narrowing of the vas-

cular lumen cannot be recognized if the blood clot does not cling to the arterial wall.

In this series, no incident of vascular spasm has occurred, and it is the impression of the authors that, in regular contrast arteriograms of the maxillofacial region, spasms are frequently simulated by an incomplete mixture of blood and opaque substance.

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### Roentgenographic localization of an impacted upper cuspid

Lino Mella. Riv.ital.Stomat. 15:112-118 Jan. 1960

Exact roentgenographic localization of an impacted upper cuspid is necessary when immediate orthodontic treatment or surgical removal is indicated.

There are many ways in which this can be accomplished. Several authors have suggested taking several roentgenograms and basing the diagnosis on comparison of the pictures. Taking an entire series of intraoral roentgenograms, comparing and interpreting them, however, is a time-consuming procedure. A far simpler method is routinely used at the Italian Dental Institute in Rome.

A 9 by 12 cm. occlusal film is placed between the patient's upper and lower teeth, not in the anterior region but closer to the examined site. The patient is asked to bite on the film gently to provide adequate fixation. His head must remain in an upright position, with the mouth and nose in the median plane, to keep the position of the film in a horizontal plane. The roentgen tube then is directed toward the supraorbital foramen on the opposite side, that is, toward the root of the nose at an angle of 55 degrees to the horizontal plane and at an angle of 10 degrees to the frontal plane. The average exposure time is three seconds.

The main advantage of this roentgenographic technic is that a buccally impacted upper cuspid cannot appear distorted on the palatal side, a distortion which often occurs in half-axial projections. One single extraoral roentgenogram usually

reveals the accurate localization. No difficult interpretation or comparison of several roentgenograms is needed; a simple inspection of the film is sufficient to provide all data concerning the impacted upper cuspid.

Istituto Stomatologico Italiano, Rome, Italy

#### **Mutation in man**

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W. D. Mann. Zahnärztl.Welt & Reform 60:647-648 Nov. 10, 1959

In 1886, Hugo de Vries (1848–1935), a Dutch botanist, observed that in groups of plants certain species exhibited definite differences from the common types. By experimentation, de Vries demonstrated that these deviant characteristics were of hereditary origin. To these new species with the deviant characteristics, he gave the term "mutants." In 1901, de Vries collected his evidence and announced his "mutation theory" which now is generally accepted and applied to the animal world including man.

It seems that in the evolution of man, the natural gamma rays have not influenced human mutation unfavorably. The artificial radioactivity, however, appears to create certain hazards in human mutation. Radioactive irradiation of the nuclei of human cells produces changes in chromosomes and genes which can be demonstrated roentgenographically.

The comparatively slight alteration of chromosomes is associated with the mutations of genes and produces chemical and physical changes in the properties of the chromosomal substance containing the genes which after mutation show profound and permanent variations which later may be preserved by natural selection.

Radioactive irradiation, therefore, whether used for diagnosis or treatment, can produce malignant growth and cystostasis by damaging the somatic cells. Ionizing rays cause mutations in man which render the genes incapable of normal function, thereby producing specific metabolic disturbances and pseudohereditary deformities.

The dominant and regressive genes are situated in the autosomes which in women are sex-linked to two X-chromosomes and in men to one X-chromosome and one Y-chromosome. The effects of ionizing rays, so far, have produced defects in various organs of the human organism. These defects occur in from 3 to 5 per cent of all infants born alive. Among these defects, traceable to dental and medical roentgenography, are anodontia vera, hypersusceptibility to dental caries, aplasia of the enamel and hematologic or endocrine disturbances, all conditions which appear to be sex-linked to mutations of the dominant X-chromosomes.

Besides the natural radiation—which cannot be avoided or counteracted—the genetic tolerance dosage in man can be exceeded by the misuse of roentgenography or roentgenotherapy. Dentists, therefore, should avoid adding unnecessarily to the genetic tolerance dosage by using extremely sensitive films and by employing measures that prevent exposure to scattered and secondary roentgen rays.

Roentgenologists have estimated that from 100,000,000 infants born alive in the twentieth century, approximately 2,000,000 exhibit pseudo-hereditary defects such as dwarfism, hemophilia, phenylketonuria, facial clefts and various mental deficiencies. If the total dosage of ionizing rays to which the human gonads are exposed at present were to be doubled (to about 150 r during a period of 30 years), the effects unquestionably would impair the future existence of mankind.

Recently, several substances have been developed which supposedly can safeguard the human organism from the dangerous effects of radioactivity: vapors of alcohol, sodium hydrosulfite and sulfur-beta aminothylisothiuronium. These substances, however, are relatively toxic. By a decrease in the oxygen pressure or by injections of bone marrow mixed with streptomycin sulfate, the resistance of man to ionizing radiation can be strengthened, and the recovery from radiation damage already sustained can be facilitated.

Ludwigstrasse 50, Wörth/Donau, Germany



# Recurrent Mikulicz's aphthae treated with topical hydrocortisone hemisuccinate sodium: double-blind controlled clinical trial

B. E. D. Cooke. *Brit.M.J.* No. 5175:764-766 March 12, 1960

A double-blind controlled clinical trial was undertaken to assess the value of topical hydrocortisone hemisuccinate in the treatment of 17 adult patients with recurrent Mikulicz's aphthae, a type of severe recurrent oral ulceration. This type of ulceration is common, with the ulcer beginning clinically as a thickening of the nonkeratinized mucosa, which within 24 hours breaks down into ulcers without any vesicular stage. The site is determined largely by trauma, and commonly is the lower lip, commissures, buccal sulci or lateral margins of the tongue. It is unusual for more than four ulcers to be present at any one time, and most ulcers last from 8 to 12 days. In this type of ulceration, spontaneous remission is common, and a good response is often given to any form of new treatment.

The tablets contained 2.5 mg. of hydrocortisone hemisuccinate with a lactose base. The placebo consisted of inert tablets consisting only of the lactose base. Patients were given four tablets a day to take when the ulcers were present, and two tablets a day when no ulcers were present, and were asked to allow the tablets to dissolve in the region of the ulceration. The patients were told that two preparations were being tested. The trial periods were of eight weeks, with an intervening period of two weeks without treatment. If during the first half of the trial patients were using tablets A, they had tablets B during the second half, and vice versa.

There was a much better clinical response to the drug than to the inert tablet, the difference being greater when the placebo was taken first. During drug treatment there was a reduction of about 50 per cent in the number of ulcer days (the sum of the duration in days of all ulcers during the period) and in the number of new ulcers, compared with the results obtained with the placebo. The differences were highly significant.

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Four patients experienced complete remissions, three while being treated with the drug and one while on the placebo. Seven other patients had only seven to ten ulcer days during the eight week period while taking the active tablets.

Apart from the relief of pain obtained by reducing the ulceration, it appeared that individual ulcers were no less painful while the patient was taking the active tablets. In almost every patient, the ulcers appeared smaller while the active tablets were being taken.

Complete remissions probably were the result of the natural history of the disease rather than that of drug therapy, since one remission occurred with the placebo and two others were maintained for three months without treatment.

No side effects were noted. It is the author's experience that only the Mikulicz type of ulceration responds to hydrocortisone hemisuccinate in this way, and that the type of recurrent ulceration with multiple shallow herpetiform erosions is made worse, not better, by local hydrocortisone therapy.

Department of Dental Medicine, Guy's Hospital, London, England

# Anaphylactoid reactions to oral administration of penicillin

Jack M. Batson. New England J.Med. 262:590-595 March 24, 1960

Reactions to penicillin may be immediate, delayed or accelerated. The term "anaphylactoid reaction" refers to a severe, immediate systemic reaction associated with hypotension and often with a shocklike state. Although anaphylactoid reactions to orally administered penicillin are extremely uncommon, they do occur. Twenty-six such cases were found in the literature in English, and two more are reported. Only 2 of the 28 cases were fatal.

The ages of the patients involved ranged from 2 to 57 years, and only 2 were under 22 years old.

Nine were male and 19 female. Twenty-five patients gave a history of previous penicillin therapy, seven having received the agent within one month of the anaphylactoid reaction to oral administration. A history of other possible allergies was found in 13 patients.

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Twenty-one of the reactions to orally administered penicillin came after taking tablets; four after lozenges; two after liquid forms, and one after taking powdered penicillin in water. The dosages varied from 800,000 units in tablet form to a small amount of a penicillin liquid tasted out of curiosity. The symptoms began within 15 minutes of ingestion in 25 patients, and within 30 minutes in the other 3 patients.

By far the most common symptom was unconsciousness (in 22 patients). Gastrointestinal symptoms, including nausea, vomiting, abdominal pain and an urge to defecate, occurred in 12 patients; skin reactions in 8; facial edema, evanosis or respiratory distress, or all three combined, in 8; and facial numbness or pruritus, or both in 6. Convulsions occurred in 3 patients, and severe chest pain in 2. Other symptoms included dizziness, weakness, "bad taste," anxiety and headache. In nine patients the blood pressure was unobtainable, and in nine others hypotension was recorded. The duration of the symptoms before therapy varied from minutes to two hours. The method of treatment varied greatly; adrenergic agents, antihistamines and oxygen most commonly were used. Five patients recovered without therapy. The total duration of symptoms varied from 30 minutes to 24 hours in the 17 patients in whom it could be estimated.

A 15 year old girl was admitted to the New York Hospital with the chief complaint of "passing out" after taking penicillin pills. On the previous day she had undergone a tooth extraction. Because of continuing pain she took two tablets of penicillin (200,000 units each) obtained from her druggist by telephone order of her dentist. She immediately had numbness of the tongue and upper lip, followed by dizziness, and then unconsciousness which lasted until she reached the hospital 45 minutes later.

After receiving 0.5 ml. of 1:1,000 epinephrine subcutaneously, the patient regained consciousness, and the systolic blood pressure rose to 85. Fifteen minutes later the blood pressure was

110/70, and the pulse 80 per minute. The erythema cleared rapidly. Forty-five minutes after receiving the epinephrine, she again became unresponsive. The blood pressure fell to 85/58. She again responded to subcutaneously administered epinephrine, 1:1,000, but then complained of fairly severe cramps and tenderness in the lower abdomen that were relieved after two large bowel movements. She was given 800,000 units of penicillinase intramuscularly, and over the next 12 hours she also received intermittent doses of 0.3 ml. of epinephrine, 1:1,000 subcutaneously, and 25 mg. of diphenhydramine intramuscularly. The blood pressure remained stable and she was discharged on the seventh hospital day.

Undoubtedly there are many more anaphylactoid reactions to orally administered penicillin than have been reported. This route appears to be less dangerous than parenteral administration. However, one still must be wary of acute reactions, and such treatment always should be started in the presence of a physician. Since the symptoms begin within 30 minutes of the ingestion of this drug in all the reported cases, it seems safe to dismiss a patient after a period of observation of 30 minutes.

New York Hospital, New York, N.Y.

### Penicillin resistance compared to penicillinase production in cultures of Staphylococcus aureus grown anaerobically and aerobically

Elizabeth H. Thiele, Bettina M. Frost and Mary E. Valiant. Antibiot. & Chemotherap. 10:20-24 Jan. 1960

The penicillin resistance of clinical staphylococcal infections has been attributed to the enzyme penicillinase. However, Gilson and Parker (1948) and Eagle (1954) have postulated other mechanisms as responsible for penicillin resistance. Fusillo and Weiss (1958) concluded from their experiments that the fundamental difference between penicillin resistance and sensitivity depends on anaerobic or aerobic metabolic pathways.

A penicillin-resistant strain of Staphylococcus pyogenes var. aureus (strain 3051) and a penicillin-sensitive strain of Staph. pyogenes var. aureus (Smith strain), cultured aerobically and

anaerobically, were investigated at the Merck Institute for Therapeutic Research, Rahway, N. J. for penicillin sensitivity and penicillinase production.

The primary cultures were used to form four groups for daily subculturing at 37°C. in trypticase soy broth for strain 3051 and in brain-heart infusion for Smith strain as follows: Group 1 grown aerobically; Group 2 grown aerobically with penicillin; Group 3 grown anaerobically, and Group 4 grown anaerobically with penicillin. Groups 2 and 4 of strain 3051 were exposed to 100 units of penicillin per milliliter daily and to 1,000 units per milliliter 24 hours before sampling. Smith strain proved to be sensitive to penicillin and, therefore, Groups 2 and 4 of this strain were exposed to 0.0125 units of penicillin per milliliter. The primary cultures and samples taken by transfers were tested for penicillinase production by the manometric technic of Henry and Housewright (1947) and for penicillin sensitivity by the tube dilution test.

Under the conditions of these experiments, anaerobiosis did not decrease the penicillinase production of the strain 3051 over the primary culture but gave slight evidence of an increasing penicillin sensitivity. The Smith strain could not be induced to produce penicillinase but under anaerobic conditions increased slightly in penicillin resistance whether or not penicillin had been added.

The results did not completely substantiate the hypothesis of Fusillo and Weiss that penicillin sensitivity or resistance is based on aerobic or anaerobic metabolic conditions. Under laboratory conditions the penicillin-resistant strain did not become significantly more sensitive to penicillin after an anaerobic transfer, whereas the penicillin-sensitive strain appeared to become more resistant to penicillin.

The difference in penicillinase production between anaerobic cultures and aerobic cultures on prolonged cultivation indicated that without the specific inducer, penicillin, the energy or metabolic products producing penicillinase were diverted into other channels. However, because the decrease in penicillinase production under anaerobiosis was completely nullified by penicillin, it could be concluded that the energy or metabolic products required for penicillinase produc-

tion are not related to anaerobic metabolism.

The alternative that penicillin itself is able to change basic anaerobic metabolism to aerobic metabolism under strict anaerobic conditions appears to be questionable.

Merck Institute for Therapeutic Research, Rahway, N. J.

### Vaccinotherapy of chronic herpes simplex

S. Leonard Rosenthal. J.D.Med. 15:96-101 April 1960

Although infection by the herpes simplex virus is common, usually the condition is more uncomfortable than dangerous. Herpes simplex may be divided into primary, recurrent and chronic forms.

In primary herpes simplex, vesicles begin to form one to two days after infection. The ulcers heal without scar formation in from seven to ten days. The usual stormy course may be mitigated and secondary infection prevented by the use of tetracycline antibiotics in appropriate dosage and anesthetic ointments.

Recurrent herpes simplex is seen in older persons who have some immunity from previous infection. The virus is residual and is activated by trauma, such as by stretching of the tissues during dental treatment, or by lessened resistance after infections, hormonal changes, gastrointestinal disturbances or other debilitating processes. The ulcers heal without scar formation in from three to seven days without treatment, but may recur. Recovery can be hastened and the patient made comfortable by cauterization of single lesions with 95 per cent phenol or by use of an anesthetic ointment on multiple lesions.

In chronic herpes simplex, the premonitory symptoms, location and appearance of the lesions are identical to those in the recurrent type. Some patients are rarely without one or more lesions, since a new crop forms before its predecessors disappear. Others have varied intervals of comfort between recurrences.

To observe the efficacy of serial vaccination with smallpox vaccine, as suggested by Woodburne (1941), 100 patients with chronic herpes simplex were vaccinated by the usual technic with commercial smallpox vaccine once a week on the right and left upper arm alternately. Previous

trials had indicated that ten vaccinations gave surest results, and this was the number planned; however, 27 patients received only from seven to nine vaccinations for varied reasons. Of these 27 patients, 4 had recurrence of lesions, controlled by additional vaccinations. Of the remaining 73 patients who received the entire series of ten vaccinations, 8 (10.9 per cent) required additional treatment for successful relief.

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Eighty-eight of the 100 patients received successful relief, with no recurrence in 2 to 12 years of observation. The 12 patients in whom the treatment failed had temporary relief for a few months. A primary reaction to the vaccine invariably indicated that the treatment would be successful. An immune reaction could be a forerunner of success or failure.

Of the 100 patients, 34 were men and 66 were women. The median age was 28 years. The duration of ulcerations had ranged from 6 months to 40 years. Most of the patients reported that the lesions appeared about every two weeks.

Temple University School of Dentistry, Philadelphia, Pa.

### Amphetamine, secobarbital, and athletic performance

G. M. Smith and H. K. Beecher. J.A.M.A. 172:1623-1629 April 9, 1960

Fifteen college swimmers, in midseason condition, swam 360 time trials after receiving either 100 mg. of secobarbital per 70 kg. of body weight, 14 mg. of amphetamine sulfate per 70 kg. of body weight, or a placebo. After each trial the swimmer estimated his performance time and gave a detailed evaluation of his performance.

Secobarbital significantly impaired performance, and amphetamine significantly improved it. The subjective data showed that secobarbital produced distortion in judgment; after taking secobarbital, swimmers thought their performances were unusually good, whereas in fact they were unusually bad. The effects of amphetamine on judgment were not conclusive.

"It is widely appreciated that alcohol can impair judgment and add to the hazard of normal activities. One can only wonder how many accidents occurring each year on the highway, in industry, in the home, and elsewhere are due in part to impairment produced by barbiturates, analeptics, tranquilizers, and other drugs given to ambulant patients. The widespread use of these medicaments by persons whose decisions, judgments, and behavior affect their own welfare and the welfare of others makes further quantitative assessment of the mental and behavioral effects of these agents a matter of practical importance."

Harvard Medical School, Boston, Mass.

### Effects of acetylsalicylic acid (aspirin)

I. Abelin and W. Berli. Schweiz.med.Wschr. 90:87-91 Jan. 23, 1960

Acetylsalicylic acid is a drug which was known in ancient times. Hippocrates and Galen recommended its use for treatment of headache, toothache, erysipelas and ulcerous lesions.

Today, acetylsalicylic acid (aspirin) is often prescribed without discrimination as an antipyretic, analgesic or antirheumatic agent. The drug, however, is not completely free from side effects such as allergic reactions, urticaria, and formation of edemas in the respiratory tract and the face.

The administration of from 1.0 to 1.5 Gm. of the drug may cause poisoning in children. The same amount also produces an increased urinary excretion of the hormonal pyrocatechin (catechol) amines such as epinephrine and norepinephrine in adults. The total amount of hydroxyphenylethylamine excreted into the blood stream is also significantly increased. The maximum urinary excretion usually occurs two or three hours after ingestion of acetylsalicylic acid. After three hours, the excreted hormonal values return to normal.

Experiments with dental patients who had taken the drug to alleviate pain prior to minor surgical procedures were carried out at the Medicodental Institute of the University of Bern, Switzerland. The results revealed that acetylsalicylic acid, even when taken in comparatively small amounts (from 300 to 600 mg.), not only increases the epinephrine and norepinephrine level in blood and urine, but stimulates the anterior lobe of the pituitary gland in its secretion of adrenocorticotropic hormone, thereby causing

a premature release of cortisone by irritation of the adrenal cortex.

In dental practice, neither buffered nor unbuffered forms of aspirin or aspiric combinations should be used for alleviation of intense pain. Various more effective analgesic agents are available.

A combination of acetylsalicylic acid, epinephrine, norepinephrine, adrenocorticotropic hormone (ACTH) and cortisone may be given instead of pure aspirin prior to dental procedures, especially in patients with a history of ulcers.

Bühlstrasse 28, Bern, Switzerland

### Anti-inflammatory action of prednisone and prednisolone, determined by the 'Pyrexal' test

L. Heilmeyer and V. Hiemeyer. Deut.med.Wschr. 85:102-104 Jan. 15, 1960

The anti-inflammatory action of the steroids prednisone and prednisolone was determined by means of the "Pyrexal" test at the Medical Clinic of the University of Freiburg, Germany.

Pyrexal is a pyrogen, a toxic substance formed by the polysaccharides of *Salmonella*.

Depending on the doses intracutaneously injected, both steroids suppressed completely or temporarily the inflammatory response (aphlogistic response). Smaller doses (less than 50 mg.) produced a low-level, rapidly disappearing response (tachyphlogistic reaction) to Pyrexal.

In instances in which a slowly developing inflammatory (bradyphlogistic) reaction to Pyrexal was observed, probably caused by an existing chronic infection, small doses of prednisone were found sufficient to produce a normal inflammatory response.

In the presence of an acute inflammatory lesion or infection, the inflammatory response of the involved tissues (facial skin and oral mucosa) was profoundly curtailed (tachyphlogistic response). In the presence of a chronic inflammatory lesion or infection, however, the inflammatory reaction of the involved tissues to Pyrexal was prolonged (bradyphlogistic reaction).

The results obtained indicate that the Pyrexal

test may be used in the differentiation of chronic inflammatory processes from acute inflammatory processes, wherever they occur and whether they are associated with necrosis, because in the latter instance the inflammatory response of the involved tissues to Pyrexal remains normal.

Hugstetter Strasse 55, Freiburg/Breisgau, Germany

### The influence of epinephrine on the incidence of bacteremia

John D. Louis. J.Oral Surg., Anesth. & Hosp.D.Serv. 18:122-127 March 1960

This investigation was undertaken to determine the influence of epinephrine on the incidence of bacteremia after tooth extraction in 68 dental patients. In a double blind test, a 2 per cent local anesthetic agent was used. Three different solutions were prepared. One contained no epinephrine, the second contained epinephrine 1:100,000, and the third contained epinephrine 1:50,000. Each patient received between 2 and 3 ml. of the anesthetic solution. The maximum time allowed for the surgical procedure was two minutes. Preoperative and postoperative blood samples were taken. A diagnosis of bacteremia was made only when at least twice as many microorganisms were found in the postoperative blood sample as were found in the preoperative sample.

Bacteremia developed in 9 of the 68 patients: in 3 of 20 patients (15 per cent) receiving an anesthetic solution containing no epinephrine; in 5 of 35 patients (14 per cent) receiving an anesthetic solution containing 1:100,000 epinephrine, and in 1 of 13 patients (8 per cent) receiving an anesthetic solution containing 1:50,000 epinephrine.

It was concluded that epinephrine in concentrations of 1:100,000 as a vasoconstrictor in 2 per cent anesthetic solution does not reduce the incidence of bacteremia after tooth extraction. In this study, the incidence of bacteremia increased when teeth were removed from mouths in poor oral health.

Langley Air Force Base, Va.

Histology

### Historadiography of hard and soft tissues

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John T. Istock, Clarence W. Miller, Franc W. Chambers, Jr., and Harvey W. Lyon. U.S. Armed Forces M.J. 11:497-506 May 1960

The development of a "sealed-off" thin-window x-ray tube has permitted laboratories operating on limited budgets to perform microroentgenography of thin sections of hard and soft tissues, and has eliminated the requirement for expensive vacuum systems. A simplified method is described for preparing and making roentgenograms of thin paraffin sections of hard and soft tissues for use in contact microroentgenography.

Soft tissues are prepared in a routine manner, including Formalin fixation, alcohol-xylene (dimethylbenzene) dehydration, and final embedding in paraffin. Sections 5 to 7 microns thick are cut on a Spencer rotary microtome and allowed to float on 40°C. distilled water. When ready for microroentgenography, the specimens are floated from the distilled water onto the emulsion surface of the slide.

Specimens of hard tissue are fixed in Formalin, demineralized and processed in graded alcohols (50, 70, 80 and 95 per cent) for two hours in each solution. After alcohol equilibration, the hard tissue is placed in terpineol for 24 hours, then soaked in dimethylbenzene for two hours and embedded in paraffin. Sections 5 to 7 microns thick then are floated on distilled water for transfer to the emulsion surface of the slide.

To produce fine detail by contact microroentgenography, an extremely fine-grain, highresolution film is required, such as Eastman Kodak spectroscopic plate 649-GH with a resolution of over 1,000 lines per millimeter. Specimens are mounted on 1 by 3 inch spectroscopic plates, a convenient size for microscopic examination and subsequent storage of the roentgenograms.



Microroentgenogram of demineralized alveolar process of dog mandible showing periodontal membrane between cementum (top arrow) and lamina dura (bottom arrow)

The film is prepared to prevent the paraffin section from adhering to the emulsion. The plates are dipped twice in a 1 per cent solution of Parlodion (shredded form of collodion) and dried for about one minute between dippings, then stored in a dust-free, light-tight container for at least one hour or until ready for use.

In the darkroom, the paraffin section is floated onto the prepared film. The section is then blotted with damp bibulous paper. The film with the adherent section is placed in dimethylbenzene for three minutes to remove the paraffin, then rinsed in 95 per cent alcohol. After the paraffin is removed and rinsing is complete, the section is ready for roentgenography.

After the reentgenographic exposure is completed, the film is placed in ether-alcohol (50-50 solution) for five minutes to dissolve the Parlodion and to remove the section from the emulsion. The emulsion then is placed in 95, 70 and 50 per cent alcohol solutions for about 30 seconds in each solution; after removal from the alcohol solutions, the film is ready for development.

The spectroscopic plates are developed in undiluted Eastman Kodak D-19 developer for seven minutes at 68°F., washed for one minute, then placed in a standard acid fix for 30 minutes. Development is completed by washing in running water for 15 minutes and drying in a dust-free atmosphere.

The x-ray generator is of local design, made to operate with a Philips CMR beryllium tube at a voltage range of from 1 to 5 kvp and with current range of 1 to 3 ma. The exposure chamber is light-tight with a set target film distance of 6 cm. A vacuum pump is used to create a partial vacuum in the exposure chamber to eliminate air attenuation of the roentgen-ray beam when using 1.5 kvp. For voltages above 2.5 kvp, the vacuum pump can be omitted.

When sections 5 microns thick are used, exposure factors of 1.5 kvp, 1.5 ma. for 30 minutes produce satisfactory results. Thicker sections require a higher voltage and a slight increase in exposure time.

Naval Medical Research Institute, Bethesda, Md.

### Histologic pulp reactions to high speed and ultrasonic cavity preparations

K. H. Rateitschak, K. G. König and H. R. Mühlemann. Schweiz. Mschr. Zahnhk. 69:477-487 June 1959

The histologic changes occurring in the pulp after cavity preparations with Borden's "Airotor" at 250,000 rpm were studied at the Dental Institute of the University of Zurich, Switzerland.

The study was conducted on 19 teeth of children between 11 and 13 years old. As controls, cavities were prepared by using rotary instruments at high speed (20,000 rpm) in six teeth, and five teeth were left untreated.

Identical methods of cavity preparation were applied to the first molars of 11 albino rats with an average body weight of 200 Gm. The second molars of these animals served as controls in the study.

The histologic changes occurring in the pulp after cavity preparation with the "Airotor" unit were similar in 85 per cent of the operations to those encountered after conventional cavity preparations. Under the conditions of this study, "Airotor" cavity preparation has no specific deleterious effect on the pulp of deciduous teeth, although in isolated instances more severe alterations were observed in the pulp after "Airotor" cavity preparation. Until the results of further and more specific investigations are available, these pulp injuries may be interpreted as thermal lesions.

The greatest advance represented by the "Airotor" in dental practice consists of increased comfort to the patient. Cavity preparation by this method is practically noiseless, vibrationless, heatless and is well tolerated even without use of local anesthetics. The operating time compares favorably with that where rotary instruments have been used.

Zahnärztliches Institut der Universität, Zürich, Switzerland

## Differential calcification rates in the human primary dentition

B. S. Kraus. Arch.Oral Biol. 1:133-144 Oct. 1959

The assertion that in man tooth enamel is deposited at the rate of 4 microns a day is the result of a gradual distortion of the results of the original work of Schour and Poncher (1937). To examine the progress of calcification during prenatal development in its gross aspects, the calcified portions of the crowns of the teeth of 76 human fetuses ranging in age from 13 to 18 weeks *in utero* were measured. Measurements were taken of the maximum mesiodistal diameter and the vertical depth of the enamel over the cuspal tips.

Statistical analysis of the results indicated that the deciduous teeth do not calcify at the same rate, either mesiodistally or vertically. The maxillary central incisor calcifies at a faster rate in both dimensions than do the other teeth.

In all teeth studied, calcification proceeds faster mesiodistally than vertically. In terms of absolute chronology, calcification mesiodistally shows a sigmoid type of growth curve not unlike that characteristic of postnatal skeletal growth.

School of Dentistry, University of Washington, Seattle, Wash.



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### Effect of the Jay diet plan on daily Lactobacillus acidophilus counts

Ernest A. Rider and James E. Dyson, Jr. W.Virginia D.J. 34:34-37 April 1960

Jay reported (1947) that it is possible to maintain a low lactobacillus level in the saliva for a considerable length of time by restricting carbohydrate intake periodically. This is accomplished by following consecutively Jay's three dietary plans. Diet plan I provides essential nutrients and sufficient calories but the carbohydrate content is restricted to 100 Gm. per day and no sugar is permitted. After two weeks the patient progresses to diet plan II in which carbohydrates, other than sugar, no longer are restricted. The lactobacillus count invariably is low after plan I; if it continues low after plan II, the patient adopts plan III which allows all forms of carbohydrate, including sugar, with one of the meals each day.

The literature reveals no record of the daily Lactobacillus acidophilus counts during the progress of the Jay diet plan. Such a study was conducted in 12 subjects (patients of Morgantown dentists) ranging in age from 12 to 40 years. Six were placed on the Jay diet plan and six served as controls.

In all six patients there was a sharp initial reduction in the L.acidophilus count after the initiation of diet plan I. This decline was continued in subjects who adhered strictly to the diet, resulting in a near elimination of Lacidophilus from the oral cavity by the end of Jay diet plan II. Intake of fermentable carbohydrates during the course of diet plan I resulted in a rapid increase in the L.acidophilus count.

Good oral hygiene along with the Jay diet and the avoidance of excessive fruit intake were effective in reducing the L.acidophilus count in the patients.

West Virginia University Medical Center, Morgantown, W. Va.

### A clinical assessment of the accuracy of the methyl red test in forecasting caries

J. L. Hardwick. Brit.D.J. 108:255-259 April 5, 1960

To determine whether methyl red would indicate hydrogen ion concentration accurately in saliva or on tooth surfaces, in vitro experiments were conducted. Thirty-two specimens of saliva were acidified and agitated with lactic acid to bring their pH within the pH range of 4.2 to 6.2. The pH of each specimen was assessed by two methods: (1) the addition of 0.1 per cent aqueous methyl red, the resultant color being matched against a series of samples of methyl red at known pH, and (2) electrometrically, using a Cambridge pH meter with a glass electrode. The results of the two methods of pH estimation agreed closely, about 50 per cent of the results as assessed colorimetrically agreeing within 0.1 of the pH assessed electrometrically. It can be concluded that methyl red is a sufficiently accurate indicator for estimating the pH of saliva and probably also of the environment on the tooth surface.

Experience gained during the first three years of the test suggested several refinements of the original technic (Hardwick and Manley, 1952) used for forecasting sites of carious activity and modified the interpretation which could be placed on the results of the test, as follows:

- 1. After the glucose rinse, the color of methyl red, which indicates the sites where a carious lesion would develop, was found to be pure red or red with a slight trace of orange corresponding to pH of about 5.2 and below. Carious lesions usually did not develop subsequently in areas where the methyl red was only orange red. The 1.0 per cent glucose should be sprayed onto the teeth in addition to being used as a rinse.
- 2. No accurate forecast could be made on erupting teeth until they came into functional occlusion with the opposing teeth. Before such teeth came into occlusion, methyl red applied to them often turned red although caries did not develop subsequently.
- 3. In fissures covered with relatively thick surface films, these films were disturbed with a fresh stainless steel probe after the application of glu-

cose and methyl red, to enable the color of the indicator near the tooth surface to be distinguished from that on the external surface of the film. Before this was done, many areas of low pH within the fissures were not recognized and therefore inaccurate forecasts were made.

In a clinical survey of the accuracy of the methyl red test, 250 examinations were carried out in the last three years. The patients' mouths were re-examined about one year after the application of the test for fresh carious cavities.

In the 250 mouths examined, it was predicted that 463 cavities would develop, and 598 fresh cavities actually developed. Of the 463 sites where fresh cavities were forecast at the first examinations, 263 (about 59 per cent) were found to have become carious at the second examination. The clinical evidence was consistent with the initial carious lesion having developed in the exact site forecast by the test. Of the 596 fresh carious cavities, 263 (about 44 per cent) included areas where caries was forecast to develop.

It would appear that the assessment of the color of the methyl red which indicates carious activity was accurate because there was close agreement between the number of cavities forecast and the number developing. The slightly higher figure of 596 (compared with 463 forecast) for cavities developing is to be expected because the difficulty of assessing the color in some interstitial areas, where visibility is poor, would result in some sites of caries activity being overlooked.

The methyl red test is based on the theory that caries is produced by an acidogenic mechanism, a hypothesis which is not universally accepted. If the development of caries were entirely dependent on the occurrence of hydrogen ion concentrations of about pH 5.2 or below, a correlation coefficient of nearly 1.0 between the cavities forecast and the cavities developing would be expected. In fact, difficulties in assessing the number of fresh carious lesions developing would make it unlikely that such a high correlation coefficient would be demonstrated even if acidity on the tooth surfaces were the only factor involved in determining whether caries would develop. In addition, rinsing and spraying the teeth with glucose can be expected only to simulate very approximately the effects of the stagnation

of fermentable carbohydrates in the food. The methyl red test cannot indicate the effect on caries susceptibility of caries-resistant tooth structure. The test is not very reliable in comparing the caries susceptibility of different subjects, but it usually indicates changes in the caries susceptibility of the same patient at different times, and is of value in assessing whether preventive measures, based on the control of the acidity on the tooth surface, should be carried out. For this purpose, the test is especially suitable; it is quick and easy to perform; it demands no elaborate laboratory facilities; the results are known immediately. Probably the greatest value of the test is as a method of demonstrating to the patient or his parents the importance of the quickly fermentable carbohydrates in the carious process and the advisability of rinsing and toothbrushing immediately after the ingestion of fermentable carbohydrates if caries activity is to be reduced.

The results obtained in the investigation suggest that the development of local acidity on the tooth surface is related to caries activity but that this factor is not the only one involved in the carious process.

University of Birmingham, Birmingham 15, England

### Millet, a cereal rich in fluorine

Walther Müller. Deut.Zahnärztebl. 14:32-33 Jan. 8, 1960

Millet, a term applied to a number of different species of cereals and grasses, is grown in Europe and the United States mainly as forage for domestic animals, but in Asia and Africa exclusively as a bread cereal.

The four millet genera, Setaria, Echinochloa, Panicum and Pennisetum, botanically belong to the family Paniceae, whereas the most common millet genus, Eleusine coracana, is a member of the Chloridea family.

Because the application of fluorine, whether in the form of fluoridation of water supplies, topically applied fluorides, fluoridated milk and salt or fluorine-containing tablets, plays an important part in control (prevention or reduction) of dental caries, it is noteworthy that the seed (grain) of millet contains four times as much fluorine as that of barley, corn (maize), oats, rice, rve or wheat. It also contains more salicylic acid, minerals and vegetable fats than the other cereals.

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In Asia, especially India, and in Africa, the bread baked with millet flour plays an important part in the diet of pregnant women. It is said that the consumption of this bread produces a favorable development of the infant's bones, cartilages, tendons and teeth (enamel).

There is no question that the ancient peoples, especially those of the Teutonic tribes, consumed more millet bread than the civilized peoples of our generation. The decrease in the dietary intake of foodstuffs rich in fluorine and mineral salts by recent man unquestionably is a contributing factor in the development of susceptibility to caries and bone disease, whereas consuming fish and millet, both rich in fluorine, produced a specific insusceptibility to these and other "civilization" diseases. Teeth free or almost free of carious lesions are often found in the jaws of fossil human skulls.

Periodontal disease in India: report of an epidemiological study

Römerhof, Zurich, Switzerland

John C. Greene. J.D.Res. 39:302-312 March-April 1960

An epidemiological study of periodontal disease in and around Bombay, India, and in Atlanta, Ga., was conducted in 1957. The study involved 1,613 boys aged 11, 13, 15 and 17 years in India and 577 boys of the same ages in Atlanta. In addition, 63 Indian men 18 to 30 years old were examined in a rural area near Bombay.

Periodontal disease was highly prevalent in both groups but was significantly more severe in India than in Atlanta. Oral calculus was more abundant in the Indian group, whereas oral debris was more plentiful in the Atlanta group than in the urban Indian group.

The rural persons studied in India had more severe periodontal disease, more calculus and more debris than those in urban India.

When groups of similar oral hygiene status were compared, there still was a statistically significant difference between the periodontal disease scores in India and in Atlanta, suggesting the presence of other altering factors.

The language, religion, method of cleansing the teeth, materials used in cleaning the teeth, and frequency of cleaning the teeth had no apparent significant association with the oral hygiene or periodontal disease scores in the study in India.

Of those studied in India, 78 per cent of the rural persons and 94 per cent of the urban persons cleaned their teeth by rubbing the index finger over the teeth and gingivae.

National Institute of Dental Research, Bethesda 14, Md.

### Danger of fluorine idiosyncrasy

Werner Rudolf, Med.Klin, 45:2055 Nov. 6, 1959

The possible danger of an individual intolerance or allergic idiosyncrasy to fluorine ions has been discussed recently in the lay press, especially in regard to the planned or instituted fluoridation of water supplies in certain communities.

Although both the dental and medical professions are not opposed to discussions of dental and medical problems by newspapers, articles on those subjects, written by inadequately informed reporters or editorial writers may mislead the general public and alarm wide masses of the population. This, for instance, has been done by overemphasizing the hazards incurred by taking dental or medical roentgenograms, and can be repeated by discussing unscientifically certain aspects of fluoridation.

Individual intolerance and idiosyncrasy to the natural or artificial fluorine contents of drinking water do not exist. Several tests, carried out to determine the excretion of fluorine in blood and urine, failed to establish a single instance of intolerance or idiosyncrasy to fluorine.

In adults, after an initial exposure to fluoridated drinking water, the urinary fluorine amount increases in proportion to the fluorine intake; a balance, however, is reached because the urinary excretion essentially equals the intake.

In growing children, the leveling off point is not reached during the period of growth and development, but the retention of fluorine within the organism remains within the limits of tolerClinical and experimental studies demonstrated that there is no evidence that the quantity of fluorine entering the body by consumption of fluoridated water leads to any demonstrable indication of individual idiosyncrasy to fluorine.

This statement, however, does not apply to adults and children who have consumed regularly drinking water with a natural fluorine content far above the optimum level nor to an excessive industrial intake of fluoride.

Pettenkoferstrasse 18, München 15, Germany

### **Water fluoridation practices**

George W. Moore. Health News 37:4:12-17,19 April 1960

In 1957 the New York State Department of Health requested the research division of the New York University College of Engineering to undertake a study of water fluoridation practices in major cities of the United States. Twenty communities in 16 states were studied. The communities ranged in population from 185,000 to 4,488,000. Twelve types of water supply treatment were involved. The chemical quality of the water supplies varied over a wide range. Hardness varied from 23 ppm to 306 ppm; alkalinity varied from 5 ppm to 218 ppm; pH ranged between 6.4 and 9.15. The calcium, magnesium, sodium, potassium and chloride levels varied widely. Most of the water supply systems had been constructed in the middle of the last century. Materials of the mains in the distributing systems included cast iron, concrete lined cast iron, concrete, steel, steel lined with concrete or bitumastic, asbestos cement, lead, and galvanized iron pipe. The length of the distributing mains in the various cities ranged from 118 to 4,100 miles. The average distance between the point of application of fluoride and the furthest point on the system varied from 6.6 miles to 35 miles. The source of the fluoride ion was either sodium silicofluoride, sodium fluoride or hydrofluosilicic acid.

Investigations of water fluoridation practices in the United States show them to be generally practical and justified. The findings of the report are:

- There are no engineering problems in the handling of fluorides that do not have adequate solution.
- Mixing of fluoride with water in volume is accomplished with the same degree of operator supervision and essentially by the same methods required in the application of other chemicals in solution, such as alum and chlorine.
- Chemical composition of the water to which fluoride is added apparently is not an important factor in placing fluoride into solution.
- 4. Neither the length of line, time of flow, age of pipe nor materials to which water is exposed affect significantly the average fluoride ion content in the distribution systems.
- 5. There is no evidence of feedback of concentrations of fluoride ion from such postulated sources as pipe coatings, tuberculation, treatment sludges, storage reservoir sediments and the like.
- 6. The average annual cost per capita to provide fluoridated water at the optimal dosages indicated for 18 cities was 7.9 cents. The average annual cost in eight cities having over 800,000 population was 8.4 cents per capita.
- 7. There is no evidence of an uncontrollable potential employee health hazard introduced by reason of handling fluoride.
- 8. There is no evidence to indicate that employees handling fluoride-bearing chemicals have been affected physiologically by their activity.
- There is no evidence to indicate that there is a loss of fluoride in filters when fluoride is present in the water before filtration.

Water Supply Section, New York State Department of Health, Albany, N.Y.

# The infectious and transmissible nature of experimental dental caries: findings and implications

P. H. Keyes. *Arch.Oral Biol.* 1:304-320 March 1960

Thirty-seven wearlings from piebald hamsters were divided as equally as possible. The 18 animals in the control group were distributed into cages, 4 or 5 animals to the cage, and not allowed contact with other animals of the colony. The remaining 19 animals were placed in cages with

hamsters known to be caries-active. The cariestest diet (Keyes, 1959) and distilled water were available to all animals ad libitum. After 35 days on the diet, the animals exposed to caries-active hamsters had obvious cavitation, whereas those not so exposed were almost free of caries. A second experiment, using a series of albino hamsters, repeated in principle the test with piebald hamsters. The findings were in agreement with those in the first experiment, and illustrate the transmissible nature of caries in hamsters.

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An experiment was undertaken to determine whether animals born of noninfectious female hamsters would develop caries following an inoculation, during the suckling period, of fecal material from caries-active animals. All the inoculated animals became caries-active.

A study was made to determine if caries could be induced by an inoculation of feces from cariesactive hamsters. Fecal material was used either as an intraoral smear or a contaminator of the drinking water. The experiment demonstrated that caries could be induced by an inoculum.

A study was undertaken to observe the effect on caries activity of antibiotics added to the caries-test diet; either 100 mg. of penicillin or 100 mg. of erythryomycin per kilogram of test diet were used. At the end of the experiment, the animals which received the antibiotics were free of caries, whereas the teeth of untreated control littermates showed typical caries activity.

A study was undertaken to observe the degree of caries activity in litters produced by females whose penicillin-sensitive flora had been depressed during pregnancy and the first week of lactation. The results showed that the transmission of caries activity from dam to offspring was disrupted by depressing the penicillin-sensitive flora of the mothers.

A final experiment, employing Osborne-Mendel rats, was undertaken to determine (1) if caries activity in this species would be altered by depressing the penicillin-sensitive flora during the suckling period, before the experimental diet, and (2) if the disease would show evidence of transmissibility as demonstrated in hamsters. The findings suggested that the flora which the animals acquired before weaning and during the course of the experiment had an important influence on the incidence and size of carious lesions; that caries was less active in rats whose penicillin-sensitive flora had been depressed during the suckling and preweanling period, and that dental caries, therefore, can be considered as a transmissible disease among susceptible Osborne-Mendel rats.

The observations seem to explain some of the variable findings that have been observed in studies of caries in experimental animals, and suggest other interpretations for the results obtained in previous investigations. The relationship between experimental animal, its microbic flora and the test diet may be more critical than has been realized heretofore in other investigations.

Some type of microbic equalization and bacterial standardization is essential to permit valid interpretations in studies designed to assess the influence of nutritional effects, genetic factors, dietary variables and systemic conditions on experimental dental caries. It now seems essential to start with animals which have been equalized microbically; that is, preconditioned by the inoculation of a standard microbic flora, after the variable and uncertain initial flora has been purposely depressed.

National Institute of Dental Research, Bethesda 14, Md.



### Comparison of glutamic-oxalacetic and glutamic-pyrivic transaminase concentrations in human saliva and serum

Samuel Dreizen, Robert E. Stone, Jo G. Dreizen and Tom D. Spies. Proc.Soc.Exper.Biol.& Med. 102:449-451 Nov. 1959

Glutamic-oxalacetic transaminase (GOT) and glutamic-pyruvic transaminase (GPT) are enzymes present in varying amounts in all body tissues. They function in the transference of amino groups from one amino acid to another.

This study was undertaken to determine the levels of GOT and GPT in stimulated saliva collected from 81 patients. GOT was found in 100 per cent, and GPT in 89 per cent of the samples of saliva. The content of GOT exceeded the content of GPT in 91 per cent of the saliva samples.

Venous blood was drawn from the same patients, and studied. There was no significant correlation between the transaminase levels in the saliva and in the serum. This signified that the prime and immediate source of saliva transaminase is oral rather than systemic.

The findings suggest that the oral flora and oral tissues both contribute to the transaminase content of saliva. Incubation of whole saliva with glucose, which stimulates the growth of oral glycolytic microorganisms, was followed in each instance by a striking elevation in the saliva GPT level and the almost complete disappearance of GOT from the samples of saliva so treated. The rise occurred in aliquots from each sample of saliva, including those samples which did not contain measurable amounts of GPT before incubation.

The significantly higher saliva GPT value in the patients with natural teeth in contrast to the value in the edentulous group provides evidence that the natural attrition of the supporting structures of the teeth and superimposed destructive processes affect the transaminase content of saliva. The degree to which the transaminase concentration of saliva is affected by oral and periodontal disease remains to be determined.

Northwestern University Medical School, Chicago, Ill.

### Induction of dental caries and pathological changes in periodontium of rat with hydrogen peroxide and other oxidizing agents

Max Shapiro, Ved Brat and Benjamin H. Ershoff. J.D.Res. 39:332-343 March-April 1960

Immature rats fed a noncariogenic stock ration and administered hydrogen peroxide in the drinking water as a 1.0 or 1.5 per cent solution developed extensive carious lesions and pathologic changes in the periodontium and submaxillary glands after an eight-week period of administration. Similar effects were noted when zinc peroxide and sodium perborate at a 2 per cent level were incorporated in the ration.

The type of caries induced differs significantly in origin and appearance from the occlusal, fissure and smooth-surface caries more commonly observed in the rat. In this study, the carious lesions started at the tip of the cusp and extended through the dentin to the pulp. Complete destruction of the crown and necrosis of the pulp with fragmentation of the tooth may occur.

The production of caries on such a diet may constitute a potentially useful procedure for the study of anticaries agents. The findings also suggest the desirability of further studies on the possible role of oxidizing agents of bacterial, salivary or food origin in the etiology of caries and periodontal disease in man.

The findings are not be interpreted as indicating that hydrogen peroxide and other oxidizing agents when used clinically will have a deleterious effect. The dosages employed and the length of time that the oxidizing agents were administered in the present experiments are never encountered under clinical conditions.

Western Biological Laboratories, Culver City, Calif.



## Syndromes of the head and neck of dental origin

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Harold Gelb and Godfrey E. Arnold. A.M.A. Arch.Otolaryng. 70:681-691 Dec. 1959

One hundred patients with otolaryngologic symptoms of dental origin were observed during the past year at the New York Eye and Ear Infirmary. The ratio of women to men was 3.5:1.

Most of the patients complained of pain in the head and neck region, which usually could be traced to certain trigger areas in the muscles of mastication. The most common sites for this pain were the temporomandibular joints and the internal pterygoid muscles. However, pain was found in other regions remote from the jaw.

Patients were rendered symptomless or showed pronounced improvement by the administration of ethyl chloride spray or procaine injections to the trigger areas in the muscle undergoing spasm. Frequently, injection into the internal pterygoid muscle would relieve tenderness and pain in the other affected muscles.

Favorable results were obtained in some patients simply by equilibrating the occlusion or by using temporary acrylic splints with adjunctive myofunctional therapy. Other patients required a combination of procedures.

In 70 per cent of the patients, pain was the main symptom.

Although bruxism was reported in only eight patients, many of the other patients either clenched, ground or gnashed their teeth. A majority of the 100 patients were found to be emotionally tense or upset.

Twenty-five patients complained of subjective ear noises. This condition was treated by correction of the jaw relationships by means of temporary acrylic splints. Of ten patients who were observed, five noted some improvement or were symptomless after this treatment. The authors concur with Schwartz (1956) in finding that Costen's syndrome does not occur uniformly in temporomandibular joint dysfunction. Five case histories illustrate the treatment methods utilized.

Dentistry has developed to the stage where it is ready to aid the otolaryngologist and other medical specialists in the differential diagnosis of head and neck syndromes. In addition, dentistry offers sound corrective procedures for restoring the proper position of the jaws in the three dimensions of space.

New York Eye and Ear Infirmary, 218 Second Avenue, New York 3, N. Y.

### Temporomandibular joint arthrosis

Peter D. Ferrigno. J.Dist.Columbia D.Soc. 35:4-7 Feb. 1960

The pathologic condition of the temporomandibular joint brought about by occlusal disharmony is termed temporomandibular joint arthrosis. This condition accounts for 90 per cent of all the dysfunctions of the joint. External trauma and diseases account for the remaining 10 per cent. Temporomandibular joint arthrosis is a noninfectious, degenerative affection of the tissues of the joint initiated by intrinsic trauma and causing abnormal changes in function. Effusion, a noninflammatory swelling of the arthritic lesion, may be caused by chronic intrinsic microtrauma by the condyle to the structures of the joint. Because of this effusion, a patient often may complain of pronounced discomfort in this region, and yet roentgenograms will reveal only slight abnormalities. Such roentgenograms should be evaluated in the light of the patient's clinical symptoms.

The positions of the condyles in the glenoid fossae are one of the roentgenographic manifestations. The articular eminence and the fossa floor may appear roughened, irregular in shape, or may show signs of erosion. The angle of inclination of the posterior wall of the articular eminence may vary between the right and left sides. The meniscus, which normally is not visible roentgenographically, may be somewhat outlined because of calcific deposits. Erosion or displacement of the meniscus may be assumed if a narrowing or obliteration of the space within the joint is seen.

Changes in the occlusion to which the joint and musculature cannot adapt will produce a variety of clinical symptoms, including clicking, crackling or grating noises, crepitation, tenderness, and pain in and around the joint. The neuromuscular manifestations include limited mandibular movements with or without pain, difficulty on opening the mouth in the morning, mandibular lock in certain positions on opening, limitation or deviation of opening, hypermobility and chronic luxation. Muscle spasm may be a cause of dysfunction, tenderness and pain within the temporomandibular joint.

In those patients with occlusal disharmonies and temporomandibular joint dysfunctions, the muscles of mastication constantly exhibit a low-grade electrical discharge, even when the mandible is supposedly in the physiologic rest position. Emotionally disturbed persons are predisposed to muscle spasm because of subconscious habits of clenching the jaws, grinding the teeth, or cheek and lip biting. Other predisposing causes are nutritional deficiencies, syndromes of the menopause, male climacteric and hypometabolism.

Any treatment plan must include general supportive care, elimination or control of any extrinsic tension factor, and the initiation of procedures which will lead to a normal balanced occlusion.

Application of dry or moist heat to the affected area for a period of a half hour, two or three times daily, is helpful. Voluntary limitation of jaw motion by the patient is more desirable than mechanical immobilization. Subsistence on a soft diet will minimize trauma to the joint and may help to reduce pain. Administration of salicylates a half hour before meals and at bedtime, and the judicious use of barbiturates and muscle relaxants, aid in the reduction of tension. The ethyl chloride spray technic may be used as a counterirritant to interrupt and block muscle spasm and referring pains. Another direct treatment of the spastic musculature is the injection of a local anesthetic into each of the involved muscles. Nocturnal grinding and clenching may be eliminated by use of a bite plane.

In certain instances, none of the aforementioned procedures may provide sufficient comfort to the patient. Only then should surgical procedures be performed. Excellent long-term results have come from the high mandibular condylectomy. In this operation the meniscus can be left undisturbed.

College of Dentistry, Georgetown University, Washington, D.C.

# External hyperostosis of the mandible angle associated with masseteric hypertrophy

Paul Guggenheim and Leon B. Cohen. A.M.A. Arch.Otolaryng. 70:674-680 Dec. 1959

The material for this study consists of 28 patients with masseteric hypertrophy, subjected to a multi-disciplinary study at the Winter Veterans Hospital and other psychiatric institutions in Topeka, Kan. The authors agree with Gurney (1947) and Kern (1954) that masseteric enlargement is a work of hypertrophy caused by the habit of jaw clenching. The presence of this condition indicates a severe underlying emotional disturbance. A central problem of the patient has to do with disposal of excess quantities of oral-aggressive energy. Patients with this condition frequently come to dentists or oncologists because of the suspicion of a dental complication or of tumor of the parotid gland.

Roentgenographic examination of the 28 patients yielded negative findings in only 5 patients; 8 patients showed protruding mandible angles, and 14 showed an additional feature (mentioned in the literature only by Masters, Georgiade and Pickrell in 1955), an external hyperostosis of the involved mandible angles.

External hyperostosis of the mandible angle is readily distinguished from laterally flared mandible angles by two characteristics: (1) irregularity of contour and (2) irregular density. The border of the growth may have an irregularly scalloped appearance or may protrude as a sharp, irregular spike—features which suggest that the deviation from normal has occurred after the basic contour of the mandible has been determined and that the hyperostosis consists of new bone laid down by an irritated periosteum.

Unknown constitutional factors, perhaps of an atavistic nature, also may play a role in the formation of the bony lesion.

Creighton University School of Medicine, Omaha, Neb.

## Development of the dentition in premature children

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Herbert Wegner. Zahnärztl.Welt & Reform 60:619 Oct. 25, 1959

The development of the dentition in 65 underdeveloped premature children was investigated at the dental clinic of the University of Greifswald, Germany.

The following conclusions were made:

 The hard substances of tooth germs at birth corresponded with the individual maturity of the premature infant.

In none of the children was tooth eruption significantly delayed.

3. In all 65 children, the erupted deciduous teeth were comparatively small but were in correlation to the body height at time of examination.

4. In six of the children, hypoplasia of the enamel of the deciduous teeth was observed, probably caused by severe systemic or septic diseases experienced by the mothers during pregnancy.

In one child, a double dental arch was observed into which deciduous and permanent teeth erupted.

Although the number of premature children examined was too small to permit definite deductions, the result of the investigation seems to indicate that disturbances in the tooth development in premature children is more common than previously assumed.

Rotgerberstrasse 8, Greifswald, Germany

### Melanotic freckle: lentigo maligna

M. J. Costello, S. B. Fisher and C. P. DeFeo. A.M.A.Arch.Dermat. 80:753-771 Dec. 1959

The morphologic, histopathologic, therapeutic and prognostic aspects of lentigo maligna are presented in ten case reports. The specific lesion, which is an easily recognizable pigmented precancerous macule, is seen frequently on the face of a patient over 40 years old.

The lesion usually exhibits a histopathologic picture resembling that of a premalignant junction nevus which, however, may progress slowly to a tumor stage showing the histopathologic features of malignant melanoma.

The histologic appearance of the lesion depends on the area and the age of the portion selected for biopsy. Multiple subtotal biopsies of the entire lesion will provide a more accurate diagnostic interpretation.

In the ten cases presented by the authors, the basic histopathologic picture consistently observed was that of a junction nevus. However, specific features seen in certain areas of the face suggest that the most frequently occurring lesion of lentigo maligna is of a malignant type. It is difficult, therefore, to differentiate these lesions histopathologically from early malignant melanomas.

Individualized treatment, consisting of surgical excision or electrodesiccation and curettage, usually provides satisfactory therapeutic, esthetic and functional results.

Long-term observation of patients with this clinically distinctive facial lesion is necessary to corroborate the assumption of the authors that the prognosis in instances of facial lentigo maligna is more favorable than that in instances of classic malignant melanoma.

140 East 54th Street, New York 22, N.Y.

# Participation of the salivary glands in maxillary and mandibular inflammations

Leon Sazama. Českoslov.stomat. 60:91-95 Feb. 1960

The clinical picture of chronic inflammation of the salivary glands resembles that of maxillary or mandibular inflammations of dental origin.

Chronic sialadenitis, the most frequent inflammation of one or more salivary glands, usually is caused by obstruction of the ducts which results in stasis and inspissation of the saliva.

Oral infection is often associated with obstruction of the ducts of the submaxillary glands promoting serious complications from pyogenic bacterial invasion. Sialograms reveal the presence of either a canalicular type or a hematogenic type of sialadenitis involving the parotid gland and simulating the clinical picture of parotitis. The disease, recognizable almost at onset, usually subsides after an early and sustained drainage, frequently

by surgical removal of a stone causing the obstruction of the duct. Unless the underlying cause, generally oral infection, is eliminated, progression and recurrence must be anticipated. Hematogenic inflammation of the salivary glands may become chronic. The glandular parenchyma may undergo atrophic changes before it is replaced by newly formed connective tissue.

Serial experiments with rats demonstrated that immediate ligature of the main duct will control the activity of the gland sufficiently to obtain improvement. The same technic can be used in the treatment of parotitis to prevent recurrence. Previously the involved gland was extirpated, which often led to the formation of fibrous tumors or other neoplasms.

Dental Clinic of the University of Hradci Králové, Czechoslovakia

### Tuberculosis of the mouth and throat

R. A. Cawson. *Brit.J.Dis.Chest* 54:40-53 Jan. 1960

Tuberculosis of the mouth is an uncommon disease. The following varieties of tuberculosis of the mouth and throat may be seen: (1) primary tuberculosis of the oral mucous membrane; (2) primary tuberculosis of the tonsils; (3) lesions of the oral mucous membrane, usually ulcers of the tongue, associated with pulmonary tuberculosis; (4) infections of the bone around the teeth, or bone infections after dental extractions, associated with pulmonary tuberculosis, and (5) involvement of the oral mucous membrane by lupus vulgaris.

Six case reports of oral tuberculosis illustrate the success of chemotherapeutic treatment with antibiotics. Problems in diagnosis are to distinguish oral cancer from oral tuberculosis, and to detect previously undiagnosed pulmonary tuberculosis. Even when the patient is known to have pulmonary tuberculosis, a lingual ulcer is more likely to be carcinomatous than tuberculous. In both conditions a similar age group is affected. and men predominate. Castigliano and Shigeoka (1953) saw only eight tuberculous oral lesions during examination of 2,200 patients with oral cancer. The main problem in the diagnosis of oral tuberculosis is the wide variation in the clinical features. Tuberculous lesions, contrary to the usual conception, may show varying degrees of induration. It is essential that all but the most transient lesions of the mouth should be examined by biopsy. A frozen section or cytological examination of a smear from the lesion may give an immediate diagnosis.

Patients with oral tuberculosis must be given at least two antibiotics to prevent the development of resistant strains of *Mycobacterium tuberculosis*; such chemotherapy must be prolonged (18 months or more) to prevent relapse. The prognosis for patients with pulmonary tuberculosis today is favorable, and there is no reason to assume that the prognosis for patients with oral tuberculosis is inferior.

Five of the patients with oral tuberculosis have been followed up for periods of between one and ten years. The results show that oral tuberculosis responds rapidly to chemotherapy.

Department of Oral Medicine, King's College Hospital Medical School, London, England



## Oral cancer in women: a study of the increasing incidence

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Walter W. Dalitsch and Sunder J. Vazirani. Am.J.Surg. 98:869-874 Dec. 1959

Recent clinical observation has strengthened the impression that cancer of the oral cavity in women is increasing in frequency. The records of the Research and Educational Hospitals of the University of Illinois showed for the period 1944 to 1948 that 11.11 per cent of the patients with oral cancer were women, for a ratio of about 1 to 10. For the period 1954 to 1958 the percentage of women with oral cancer had increased to 19.83, in the ratio of 1 to 4.71. The records of the Cook County Hospital showed for the period from 1943 to 1947 that there were 302 patients with oral cancer, of whom 40 were women and 262 were men, in a ratio of 1 to 6.55. For the period 1953 to 1957 there were 256 patients with oral cancer, of whom 46 were women and 210 were men, in a ratio of 1 to 4.56. Other investigators have found a similar trend. The increased incidence of oral cancer in women is associated with an increasing use of tobacco by women and suggests a causal relationship.

In most of the authors' patients with oral cancer, the exposure to tobacco had been continuous for from 10 to 20 years. Russell (1955) states that the incubation period for cancer is 20 years. Therefore more instances of oral cancer will be encountered in women in the near future because a large segment of the female population now has had this lengthy exposure to tobacco. Two case reports describe oral cancer in women patients who were heavy smokers for many years.

If a degree of prevention of oral cancer is to be achieved, physicians and dentists must advocate a program which will: (1) educate their patients to avoid harmful habits such as smoking, to seek early advice and aid if any abnormality is sus-

pected, and to practice self-examination of the oral cavity; and (2) help to discover and remove or correct noxious influences such as neglected oral hygiene, chronic dental infection and inflammation, mechanical, thermal, actinic and chemical irritants, and early lesions such as leukoplakia and benign growths.

Cook County Hospital, Chicago, Ill.

### Multiple malignant tumors involving the oral mucosa and the gastrointestinal tract

Irving Meyer and Gerald Shklar. *Oral Surg.*, *Oral Med.* & *Oral Path.* 13:295-307 March 1960

The oral cavity and the gastrointestinal tract often are attacked by several apparently distinct and unrelated malignant tumors. This tendency is of interest in relation to the prognosis and management of oral cancer.

Of 768 patients with carcinoma of the oral cavity seen at the Westfield (Mass.) State Sanatorium from 1938 through 1958, 48 patients had multiple primary malignant tumors of the oral cavity and gastrointestinal tract.

In 36 of the 48 patients there were multiple, separate epidermoid carcinomas confined to the oral mucosa. The 34 men and 2 women ranged in age from 39 to 84 years. The time interval between the appearance of the multiple lesions varied from 0 to 12 years. Of 24 patients in whom a positive or negative history of smoking was obtained, at least 7 patients were heavy smokers. A history of syphilis prior to the development of the oral malignant tumors was established in nine patients. Nine of the 36 patients died of oral cancer.

In the second group, consisting of 18 patients, there were malignant tumors of the oral mucosa as well as malignant tumors in different regions of the gastrointestinal tract. These gastrointestinal sites were the esophagus (five patients), stomach (seven patients), intestine (two patients), colon (one patient), rectum (two patients) and cecum (two patients). Of the 18 patients with oral and gastrointestinal lesions, 6 had multiple oral lesions. Of 12 patients whose smoking habits were recorded, 9 were moderately heavy smokers,

using cigars and pipes rather than cigarettes. Syphilis was not recorded in any of the 18 patients. All 18 patients were men, ranging in age from 51 to 84 years. Mortality was high, 11 of the 18 patients succumbing to gastrointestinal cancer.

Most of the symmetrical bilateral lesions in the oral cavity were found on the labial mucosa (11 instances) and the tongue (5 instances). In this entire series, the gingiva (and the alveolar mucosa in edentulous patients) was involved in only 4 instances, as compared with 15 for the tongue, 11 for the buccal mucosa, 23 for the lip, 12 for the floor of the mouth and 6 for the palate. The largest number of these multiple oral malignant tumors consisted of proliferative, raised lesions. In ten instances, the carcinomas developed in regions of leukoplakia which had been present for some time.

The following conclusions were drawn:

- There is an increased tendency in a patient with one primary malignant oral tumor to develop another malignant tumor of the oral mucosa.
   There is a lesser tendency for such a patient to develop a malignant tumor in the gastrointestinal tract.
- Patients with oral tumors should be followed carefully and systematically at regular, frequent intervals.
- Premalignant lesions, such as leukoplakia, should be treated aggressively in patients with a history of previous oral carcinoma.
- 4. All sources of local irritation in the mouth of a patient with a history of oral carcinoma should be evaluated and removed. Any infections, either periapical or periodontal, should be eliminated. Continual chronic irritation of the mucosa in susceptible patients must be accepted as an etiologic factor of prime importance in the development of malignant tumors.
- Gastrointestinal symptoms in patients with previous oral carcinoma must be evaluated by the internist or gastroenterologist.

Westfield State Sanatorium, Westfield, Mass.

### Salivary gland tumors

Cancer Bul. 12:29-30 March-April 1960

Of 148 patients with salivary gland tumors treated at the M. D. Anderson Hospital, Houston, Texas, between 1944 and 1957, 91 had parotid gland tumors, 8 had tumors of the submaxillary gland, 39 had tumors of the minor salivary glands (in the palate, sinus, tongue, nasal cavity, buccal mucosa, upper lip or tonsil); the majority had tumors of the major salivary glands. The incidence of malignancy was about 50 per cent in patients with tumors in the major salivary glands, and about 80 per cent in those with tumors in the minor salivary glands.

Aspiration biopsy no longer is utilized at this hospital; the entire tumor is removed and immediate diagnosis is made by using the cryostat. Simple enucleation no longer is considered adequate because of the danger of recurrence. If the lesion is benign, the preferred treatment is superficial parotidectomy or total removal of the submaxillary triangle. The recurrence rate with benign tumors is about 3 per cent.

If a parotid gland tumor is malignant, total parotidectomy is performed, with neck dissection in continuity, except in malignancy of a comparatively low-grade virulence. For patients with malignant tumor of the submaxillary gland, treatment consists of excision of the submaxillary triangle and radical neck dissection. The digastric and mylohyoid muscles are removed and usually the lingual nerve is ablated.

The minor salivary gland tumors in this series are of particular interest because of the unusually large number and because of the high incidence of malignant changes. These tumors usually consist of a firm submucosal mass at first, which ulcerates only after considerable enlargement. About half of the patients with malignant tumors of the minor salivary glands had died from disease at the time of the study.

M. D. Anderson Hospital, 6723 Bertner Drive, Houston, Texas



### Upper respiratory flora of husbands and wives: a comparison

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Henry Stimson Harvey and Marjorie Bodwell Dunlap. *New England J.Med*. 262:976-977 May 12, 1960

If contact alone were the determining factor in upper respiratory flora, it could be assumed that married couples generally would carry the same kinds of bacteria.

The authors observed the throat and nose flora of 75 married couples. The oropharynx was swabbed vigorously with one swab, both nares with another, and the swabs were transported in test tubes to the laboratory and planted within two hours. Cultures were planted on horse-blood agar plates, and determined within 24 hours. Swabs were taken once a month on each participating family for about 15 months.

Normal flora was considered to consist of alphahemolytic streptococci and Neisseria catarrhalis in throats, and staphylococci, with or without diphtheroids, in noses. In addition, seven common, but by no means ubiquitous, transient microorganisms were found with the methods of identification used. The seven microorganisms were: hemolytic streptococcus, Hemophilus influenzae, pneumococcus, staphylococcus in the throat, and H. hemolyticus, coliform bacteria and veasts in the nose.

A couple was called "positive" if at least one of the pair had the organism in question at least once, and negative if neither was ever found with it during the period of observation.

More than half the couples were negative for

the hemolytic streptococcus, for the pneumococcus, staphylococcus in throats, coliform bacteria and yeasts. In contrast, more of them were positive for the two hemophilus species.

Thirty-six married couples were positive for the hemolytic streptococcus; of these couples, this microorganism was present in one member only in 24 couples, and was not transmitted to the mate. The same general proportion held true for pneumococcus, and for staphylococcus in throats. An even greater disproportion was found for coliform bacteria and yeasts. On the other hand, 67 couples had *H. influenzae* and 67 also (not precisely the same 67) had *H. hemolyticus*, and of these in only 16 and 19 couples respectively, was the microorganism present in only one member of the pair, both members being positive in 51 and 48 couples.

Five couples only were found simultaneously positive for hemolytic streptococci, and these altogether on 12 occasions; 38 couples were simultaneously positive for *H. influenzae* on 89 occasions, and 37 couples were simultaneously positive for *H. hemolyticus* on a total of 88 occasions.

Husbands and wives do not always carry the same bacterial flora. They do not necessarily carry the same bacteria simultaneously, even though they both may be found to harbor the microorganisms in question at separate, unrelated times. Microorganisms differ in their ability to colonize in the respiratory environment. Some kind of host immunity appears to play a part in this selective distribution of respiratory flora.

Boston University School of Medicine, Boston, Mass.



# Parotid gland secretion rate as method for measuring response to gustatory stimuli in humans

Howard H. Chauncey and Ira L. Shannon. Proc.Soc.Exper.Biol.& Med. 103:459-463 March 1960

To measure quantitatively the effect of gustatory stimuli, a new approach was used in an experiment with 138 young men as subjects. Wetted cotton applicator sticks were used to apply each of four gustatory submodalities (solutions of citric acid, sodium chloride, sucrose and quinine) to the tongue. The wetted cotton was run around the lateral edges of the tongue, and was swabbed along the entire dorsum of the tongue from the circumvallate papillae to the tip. Samples of parotid saliva, collected in tubes, were obtained by means of vacuum cups. The secretion rate (milliliters per minute per gland) was determined for each subject. The application rate was maintained at four swabs per minute. The maximum stimulation time was 20 minutes for the sodium chloride and sucrose solutions, and 15 minutes was the maximum for the citric acid and quinine solutions.

The secretion rate had a linear relationship to the logarithm of frequency of stimulations (swabs per minute). Increasing the concentration of gustatory stimuli resulted in increased secretion rates. The response was linear throughout for sucrose and quinine, but was linear only with lower concentrations of citric acid and sodium chloride.

The results indicated that at least three different gustato-salivary reflex pathways were involved. It is believed that the procedure described offers a practical means of studying the physiologic aspects of human gustation and the mechanisms controlling salivary secretion.

Tufts University School of Dental Medicine, Boston, Mass.

# Removal of particles and bacteria from gingival pockets by tissue fluid

Niels Brill. Acta odont.scandinav. 17:431-440 Dec. 1959 [in English]

Brill and Krasse (1958) and Brill and Björn (1959) have shown that ordinarily a stream of tissue fluid passes from subepithelial spaces through the epithelial cuff into gingival pockets and thence into the oral cavity. These authors suggest that this stream of fluid is able to eliminate bacteria and particulate matter from gingival pockets.

The present study was undertaken to gain information about the flushing action on nonvital particles and living bacteria. A charcoal suspension was prepared which contained particles ranging in size from 0.5 to 50 microns, discernible in the light microscope. By means of a syringe, some of the suspension was deposited in 34 gingival pockets of two dogs who were anesthetized by thiopental sodium. The experiments lasted about two and a half hours.

When the pockets in one quadrant were filled, the overflow of charcoal was washed away with surgical sponges. Particles of charcoal still remaining on the teeth and the marginal gingivae were blotted off by means of strips of filter paper. Experimental strips of filter paper then were placed on the gingivae and the teeth, bridging the entrance to the gingival pockets. Thus, the strips were in a position to take up fluid oozing out of the pockets. The time interval between application and removal of each of the 34 experimental strips varied between 6 and 20 minutes.

On microscopic examination, the experimental strips were found to bear small particles of charcoal, of a shape, size and distribution similar to those of particles in the freshly prepared suspension.

Similar experiments were performed with a bacterial suspension prepared from Serratia marcescens. Samples taken from gingival pockets with filter paper yielded growth of many colonies.

It is concluded that the flow of tissue fluid from subepithelial structures of marginal gingivae is able to remove particulate matter, including bacteria, from gingival pockets.

Royal Dental College, 4 Universitetsparken, Copenhagen Ø, Denmark

### Sagittal condylar guidance

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Ulf Posselt. Odont.Revy 11:32-36 March 1960 [in English]

The role played by the temporomandibular joint as guidance during mandibular movements remains a controversial subject. The author recently completed a film which presents some experiments made on one subject to illustrate the following two problems:

- 1. Does the sagittal condylar path inclination influence the movements of the mandible?
- 2. Does (a) the shape of the occlusal pattern or (b) the location and type of occlusal stress influence the condylar path?

As regards the first problem, by means of a movable acrylic model of the mandible with adjustable condylar and incisal guidance, it is shown that the path of a molar cusp is influenced by both incisal and condylar guidance.

In relation to problem 2 (a), a number of experiments with the McCollum gnathograph fixed to a patient with a normal dentition are shown. Various tooth guidances, flat and curved, are made to influence lateral gliding movements of the mandible. Registrations of sagittal condylar paths are identical for these various guidances and also when the patient chews with full contact of his own teeth.

As regards problem 2(b), an experiment similar to that made by Wustrow (1928) is shown, and in addition the patient is made to bite on hard gutta-percha and to chew various kinds of food. Experiments are shown with a steel ball placed in the right side of the mouth. When strong biting pressure is exerted, the right stylus (on the working side) moves downward, whereas the left stylus (on the nonworking side) moves upward; the whole mandible seems to tip around the steel ball. This, however, was not the case when a ball of hard gutta-percha was bitten on; in this instance, the styluses cannot be seen to move as they did when the patient bit hard on the steel ball.

There was no deviation from the "empty" condylar path tracing visible during chewing of food. Each of the tracings forms a single line of a pulled-out "S." The condyle paths, however, if recorded for all possible gliding movements, do not form a single line but a double line or broad "S."

Because the experiments reported were carried out only in one person, the drawing of direct conclusions is not justified. However, it does not seem likely that the "Wustrow effect" has any significance on the imitation of mandibular movements in the articulator. It is futile to argue which component of the masticatory system is the most important for mandibular movements in general. Rather, it is important to distinguish between different types of movements or positions.

Royal Dental School, Malmö S, Sweden

# Electromyographic studies of the activity of the masticatory muscles during sleep

Ewald Kraft. Stoma 13:7-21 Feb. 1960

The activity of the masticatory muscles during sleep was investigated in 167 dental patients at the department of prosthetic dentistry of the University of Kiel, Germany. A specially constructed electromyographic apparatus recorded the changes in the electric potential of the muscles, voluntary and involuntary muscle contractions and muscular reflex reactions on easily interpretable electromyograms.

In most of the patients examined, a more or less intensive activity of the muscles of mastication could be determined; only 10 per cent of the patients presented the phenomenon of "empty" mastication during sleep. During eight hours of sleep, there were from 12 to 259 muscular contractions registered. The average time of an isolated muscle contraction was less than 1 second, but occasionally contractions lasting 60 seconds were recorded.

Most of the patients showed, besides the "tonic-horizontal" movements of the lower jaw, a distinct "clonic-vertical" movement toward the upper jaw. The ratio between the so-called "grinders" and "squeezers" was about 50 to 50. Masticatory forces estimated as being from 10 to 20 kg, were exerted during sleep.

Chronologic age, type of denture worn or of crowns and bridges inserted, seem to exert no statistically significant influence on the incidence of "empty" mastication occurring during sleep.

Weimarer Strasse 8, Kiel-Wik, Germany



# Synthesis of dental alloys containing precious metals: an introduction to dental metallurgy

H. Schlegel. Deut. Stomat. 10:13-32 Jan. 1960

The utilization of alloys containing precious metals in prosthodontic practice requires a basic knowledge of metallurgy, especially of the synthesis, properties and processing of these alloys.

The art of producing such alloys has been known since ancient times. Fundamental in the synthesis of dental alloys is the specific technic used to fuse and melt two or more metals together by forming mixed crystals in a systematically arranged space lattice which is homogeneous. Only homogeneous alloys possess the properties required for stability, durability and permanence after insertion.

The most frequently used dental alloys are composed either of gold and silver, gold and platinum, gold and palladium or silver and palladium. To obtain a higher degree of hardness and strength, nonprecious metals are often added to the mixture without being separated into distinct layers in the solid condition.

Gradually, the metallurgic art has advanced so that nearly all metallic elements can be produced in a more or less pure condition. There are various combinations of 50 or more metallic elements (precious and nonprecious metals fused and melted together or with nonmetallic elements) manufactured in a search for a superior dental alloy.

The properties of such an alloy will depend on the proportion and arrangement of its components. Dental alloys composed mainly or partly of precious metals differ greatly from each other in hardness, melting point, electrical conductivity, density and ductility. Many of these specific properties can be transmitted to an alloy in which only one precious metal (mainly gold) is used, and the usefulness of such an alloy can be approximately calculated by applying the rule of mixtures. The outstanding characteristic of a dental alloy is its ability to be plastically deformed without rupture. This plastic deformation of the metallic substance is possible because a portion of the crystals will shift to one or more of the crystallographic planes without breaking. Copper, for instance, is often added because it forms an eutectic mixture with silver, thereby improving the alloy's mechanical properties such as hardness, elasticity, rigidity and solidity.

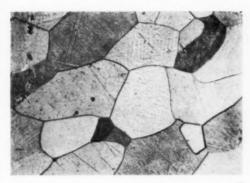
For the dentist or dental technician, the hardening of an alloy containing precious metals is important because the quality of the restoration depends on this property. Hardening can be achieved by separation into the component parts of an originally homogeneous mixture at a specific range in temperature. This procedure is done in two phases as follows: (1) by accumulation of the foreign atoms within the crystal lattice, preferably at the grain's borders, and (2) by separation of the foreign atoms. Casting of a dental alloy should be performed only during the first phase (increase in hardness) to avoid disturbance in the heterogenicity of the alloy by the separation process during the second phase.

The available dental alloys containing precious metals can be divided into the following groups:

- 1. Yellow dental alloys, mainly gold-silvercopper alloys which may be enriched by addition of platinum or palladium.
- 2. Pale yellow (tooth-color) dental alloys, mainly gold-palladium alloys produced on the basis of a gold-palladium-silver-copper mixture.
- White dental alloys, mainly silver-palladium alloys produced on the basis of a pure silverpalladium mixture which may be enriched by addition of gold.
- Gray-white dental alloys, mainly silver alloys produced on the basis of a silver-cadmium mixture.

Most of the presently available dental alloys are admixtures of one or several precious metals with either zinc, cadmium or both. These or other nonprecious metals have been added to obtain a lower melting point.

Mozartplatz 2, Freiberg/Saxonia, Germany



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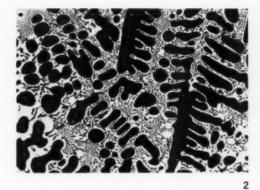
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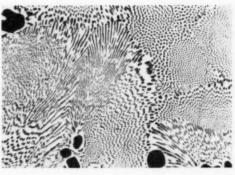
Figure 1 Crystal lattice of a gold alloy

Figure 2 Heterogeneous crystal lattice of a silver-copper alloy (50 per cent silver)

Figure 3 Heterogeneous crystal lattice of an eutectic silver-copper alloy (72 per cent silver)

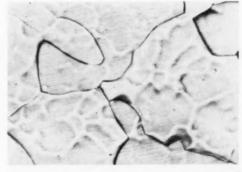
Figure 4 Crystal lattice of an 18 carat gold alloy containing gold, silver and copper

Figure 5 Crystal lattice of homogeneous silver alloy after casting



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#### Do you remember?

F. E. R. de Maar. Nederlands tandarts. 14:390 Nov. 1959

In the twentieth century, our modern streamlined, glittering and highly sanitary dental offices may enhance the potential services of each practitioner by providing him with a functional workship in which to practice his profession. The past centuries, however, often provided the dentist with fine pieces of equipment which now have become collector's items.

One of the most unusual pieces of dental equipment ever exhibited in a museum is the instrument cabinet presented in the illustration. Made of hand-carved walnut, the cabinet is 6 feet 10



inches high, 3 feet wide and 1 foot 10 inches deep. It consists of three parts, a roll-top desk, and two main cases. The two cases are separated by a white alabaster plate. The upper case consists of a large drawer and ten small drawers, the lower case of a large compartment and a top drawer. Behind the roll top is a wonderful Venetian mirror attached to the back of the cabinet.

This dental instrument cabinet was manufactured by the firm of Geo Poulsen of Hamburg, Germany, in 1891. At that time the purchasing price was 350 German marks, then equivalent to \$84. Poulsen's company was known all over Europe for making excellent furniture for dental offices. If some of the readers should discover such, or similar, pieces of dental furniture in an old dental office, the dental department of the Museum of the University of Utrecht, The Netherlands, would appreciate immediate information.

5 Jutfaseweg, Utrecht 1, The Netherlands

### Effect of noise made by the dental turbine drill

Ian G. Robin. D.Practitioner 10:148-152 March 1960

Noise affects persons in two ways-by its nuisance value and by damage to the hearing. The damaging effect of noise depends on five main factors: noise level, length of exposure, continuity of exposure, frequency component of the noise, and the individual susceptibility to noise.

A 43 year old dentist complained of persistent pain in both ears. There was no tinnitus, no apparent deafness, no previous history of ear trouble, and no family history of deafness. He had been using a turbine drill for one week. Examination revealed a hearing loss of 20 decibels (db) in the right ear and of 15 db in the left ear, both at the 3,000 cycles per second (cps) frequency. He was advised to cease using the drill and to wear rubber earplugs. Two months later, a test showed he had normal hearing again.

To analyze the noise of dental turbine drills, tests were made on the heads of four models, each operating at 250,000 rpm. The distance from the head to the noise level meter was 12 inches; this was considered as the average distance between the dentist's ear and the patient's tooth.

Three components of frequency were noted—at 5,500, 4,000 and 2,400 cps. The respective levels of noise at these three frequencies were 80 db, 60 db and 60 db. (In one drill, the 4,000 cps frequency gave an 80 db level.) The subjective effect of the drill noise was noted. One drill, operating at 40 pounds of pressure, caused noticeable pain in the author's ear. Another model caused slight pain and the remaining two models no pain.

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This brief test indicated that the noise level of high-speed drills is such that, without any precautions, some dentists may receive permanent cochlear damage. The manufacturer should ensure that a drill does not exceed a noise level of about 75 db at 12 inches.

The dentist using a turbine drill should observe the following prophylactic measures:

- 1. Select a drill head which has a low noise level.
- Work as far from the drill head as practicable.
- 3. Utilize short periods of drilling (such as half a minute) with rest intervals of several minutes.
- Dampen sound in the office with absorbent curtains and carpets.
- Wear earplugs or "muff" ear defenders while drilling.
- Have an audiometric hearing test of susceptibility to hearing loss.

If exposure to the noise of the turbine drill is short and intermittent, there is little risk to the hearing of the patient or the dentist.

St. Mary's Hospital, Paddington W.2, England

### The development of the dental drill

Richard R. Stephens. New Scientist 7:393-396 Feb. 18, 1960

The restoration of carious or fractured teeth, as a preferable alternative to their extraction, is no new procedure. A hundred years ago it was common practice to fill teeth with cements or cohesive gold. Hand chisels were used to chip away overlying enamel, and the carious dentin beneath was removed with excavators and long-handled burs which were twisted between finger and thumb. Later, the principles of the Archimedian screw and cog gears were applied to increase the

speed of rotation. The dental profession was faced with the problem of devising rotary tools which could prepare and shape cavities precisely. Although clockwork and hydraulic motors were designed and used, the dental treadle foot engine, designed in 1872, was the first practical solution. The treadle was replaced with an electric motor in 1883. The cable drive did not transmit smooth rotation to the bur when pressure was applied at low speeds; by 1910 the cable drive had been superseded by an alternative transmission, the endless cord. Thus was born the familiar dental drill, foot-controlled, with four speeds forward and reverse, with a range of 1,000 to 10,000 rpm.

One cause of pain was that of heat production when cutting or grinding. The expedient of using handpieces with nozzles delivering a jet of water or a spray of water droplets in air did not come into general use until about 1945, although individual dentists had been employing coolant sprays and jets for the previous 30 years.

In the battle against vibration, continual improvements have been made in handpiece bearings. The possibility of eliminating the distressing vibration of rotary tools seemed so remote that alternative methods for the removal of tooth substance were sought. The first of these was the air abrasive apparatus which came into clinical use in 1950. The other was the ultrasonic drill. Both have been discarded because of disadvantages.

Speed-increasing attachments or modifications to the engine and endless cord transmission were used to achieve speeds of 30,000 rpm. To attain higher speeds, the handpiece was provided with one or more internal endless belts, so that the bur bush rotated four to six times for each revolution of the driving pulley at the rear end of the handpiece. Speed-increasing handpieces of this type now are in successful clinical use, giving maximum bur speeds of 120,000 to 150,000 rpm.

The principle of the air turbine was utilized, but in experimental prototypes it was found that the bearings would not stand up to prolonged use at speeds of more than 200,000 rpm. The breakthrough to ultrahigh speeds came with the development of high precision stainless steel miniature ball races, in about 1953. These could withstand speeds of 300,000 rpm or more, provided that continuous lubrication was available

from oil mist in the air supply line. Ultraspeed air turbine handpieces of this basic pattern now are in world-wide use. Dentistry has entered a new era in cutting and grinding technics. Tungsten carbide burs in these handpieces will almost wipe away hard intact enamel, no pressure or vibration being detectable by the patient. The burs or diamond abrasives used at this speed develop great local heat, and must be cooled continuously by water spray or jet.

The next logical step seems to be to replace the noisy turbines by electric drives providing silent bur rotation with a speed range of 1,000 to 300,000 rpm; this is a challenge to inventors and designers.

Eastman Dental Hospital, London, England

### Management of diabetes mellitus in patients undergoing dental procedures or oral surgery

Stanislav Juna. Časop.lék.česk. 49:174-181 Feb. 5, 1960

Diabetes mellitus has ceased to be a contraindication for any type of dental procedure or oral surgical intervention. The number of diabetic patients who receive dental treatment has steadily increased during the past four decades after the discovery of insulin and will continue to increase in future years.

Among the factors responsible for this increase in successfully treated dental patients with diabetes mellitus are their longer survival ratio bringing these patients into the age groups most prone to periodontal disease or oral tumors requiring surgical procedures, the increasing incidence of diabetes in the population of most European countries, and the development of safe technics for elective surgical interventions formerly avoided in treatment of diabetic patients.

When modern methods of anesthesia, fluid and electrolytic replacement, antibiotic therapy and control of metabolism and nutrition have been utilized, the diabetic patient can be considered a safe subject for any type of dental procedure or oral surgical intervention.

Such methods have been used in the management of 350 diabetic patients treated at the Stomatologic Clinic of the University of Prague, Czechoslovakia, in 1959. Cardiovascular disease and unspecific infections, however, increased significantly the surgical risk in some of the patients. Isophane insulin, given alone or together with other insulins preoperatively, has been used because of its rapid and prolonged action. In dental patients in whom the disease appeared to be insufficiently controlled or in whom severe acidosis had developed, insulin was given in doses determined by their physicians according to the degree of glycosuria, and the dental procedures or oral surgical interventions were postponed until the metabolism became stabilized.

Intravenous feeding, given before, during and after the operations, adequately replaced the carbohydrate content of the diet and corrected certain dietary deficiencies.

In the management of patients with diabetes mellitus undergoing dental procedures or oral surgical interventions at the clinic, no significant advantage has been found in the substitution of fructose for dextrose in intravenously administered solutions.

Budějovická 800, Prague-Krč, Czechoslovakia

### Ingestion of plaster of paris

J.A.M.A. 172:991 Feb. 27, 1960

Q.—What symptoms will follow ingestion of powdered plaster of paris and what treatment can be recommended?

A.—The ingestion of plaster of paris (anhydrous calcium sulfate or dihydrate with about 5 per cent of water) may result in obstruction of the patient's upper intestinal tract, particularly of the pylorus, because plaster of paris hardens quickly after absorption of moisture. Treatment consists of giving glycerin or gelatin solutions or large volumes of water to delay the setting process. Surgical removal of the material may be necessary.

535 North Dearborn Street, Chicago 10, Ill.



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The information reported here is obtained from manufacturers. Dental Abstracts does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.

A new "Brunet" shade of Duraflow has been developed to satisfy the demand for a more suitable denture resin for dark-complexioned denture patients. The new shade is described as darker and more purplish than the conventional denture base resin. Samples are available. Product Research Laboratories, 90 Hamilton St., Cambridge 39, Mass.



A new, Series 300 polishing lathe provides cool operation and will not "creep" on the bench, according to the manufacturer. The lathe weighs 38 pounds, and has nonsliding rubber feet. The steel shaft, hardened by the Baldor process, has no end play. The ball bearings are sealed against entrance of dust or pumice. The shaft center is 4½ inches from the base. The lathe has been approved by Underwriters' Laboratories. Baldor Electric Co., 4353 Duncan Ave., St. Louis 10, Mo.

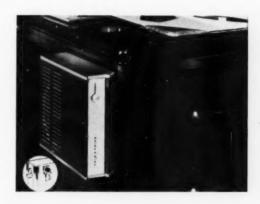
"Indian Head" diamond points embody a new process in which the diamond is impregnated to the shaft; the process is said to eliminate peeling. Slots in the shanks of the friction-grip diamonds eliminate slipping in the handpiece, it is claimed. Diamonds are available in 38 sizes, and in kit forms for prosthetic dentistry, for jacket crown preparations and for finishing. Union Broach Co., Inc., 80-02 Fifty-first Ave., Elmhurst, N.Y.



The new "Philips Oralix Super 50" dental x-ray unit can be mounted directly on any dental operating unit. Designed for radiation safety, the unit is said to provide a lower integral absorbed dose to the patient than with conventional dental x-ray units, and to protect the operator from scattered radiation. Other claimed advantages include greater efficiency of operation, lower energy requirement, smaller tube, lower operating temperature and better cooling. The small size of the unit has a reassuring effect on patients, especially on children, it is claimed. No special power line is needed. North American Philips Co., Inc., 525 W. 52 St., New York 19, N.Y.

The "Central Vac-uator" is described as an oral evacuating unit that, from one power source, can serve up to four operators working simultaneously. The unit provides the high-volume, low-pressure suction required with high-speed cutting technics and oral surgery. Claimed advantages of the unit are that it eliminates noise and odor in the office, and eliminates the necessity of emptying bottles. The waste is automatically flushed into existing drainage. Literature is available. Central Vacuum Corp., 3008 E. Olympic Blvd., Los Angeles 23, Calif.

A "Talk-A-Phone" deskside intercommunications unit has a bracket attachment which permits placement of the unit on the side of a desk, or on a wall or table, to free office work space. Talk-A-Phone Co., 5013 N. Kedzie Ave., Chicago 25, Ill.



Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

Child behavior and the dental experience. William L. Croxton. 1960. M.S.D. Indiana University.

A study of the effects of colored opaques on porcelain veneers fused to gold castings. John F. Johnston. 1960. M.S.D. Indiana University.

The effect of highly concentrated solutions of stannous fluoride on human gingival tissue. Robert Paul Swieterman, 1960, M.S.D. Indiana University.

A cephalometric investigation of the dentoskeletal morphology of Class II, Division I malocclusions. John E. Kreager. 1960. M.S.D. Indiana University.

A serial cephalometric study of human maxillary growth. Robert Callis. 1960. M.S.D. Indiana University.

Observations of the effects of high frequency sound waves on the skin and oral tissues of the rat. Niles McKendra Hansen, Jr. 1960. M.S.D. Indiana University.

A new approach to the topical application of fluorides for the reduction of dental caries in children. Charles Willis Gish. 1960. M.S.D. Indiana University.

An investigation of the dental pulp hemogram as a diagnostic aid for vital pulp therapy. Thomas Joseph Guthrie. 1959. M.S.D. Indiana University. The effect of stress and desalivation on the healing of extraction wounds in the albino rat. Estell E. Morris. 1960. M.S. Indiana University.

Sterilization in anesthesia and surgery. Ghislaine Genard Verswyvel, Alberto Carbo Rincon, Jaime Castillo Gonzalez and Eduardo Vargas Cornejo. 1959. D.ODONT. Xavier Pontifical Catholic University, Colombia.

Organization of medicodental service in the army health corps. Ramon Jose Rueda Ribero. 1959. D.ODONT. Xavier Pontifical Catholic University, Colombia.

Oral administration of penicillin in oral surgery (Über die perorale Penicillinanwendung in der zahnärztlichen Chirurgie). Ruprecht Mellert. 1959. DR.MED.DENT. University of Mainz, Germany.

Determination of the cholesterol level in the blood of patients with dental cysts (Untersuchungen über den Blutcholesterinspiegel bei Trägern odontogener Zysten). Arno Marquetand. 1959. DR.MED.DENT. University of Heidelberg, Germany.

Cholesterol level in the serum of patients with dental foci and the general disease symptoms associated with focal infections (Der Serumcholesterinspiegel bei Patienten mit odontogenen Herden und allgemeine Krankheitssymtomen im Sinne des Herdgeschehens). Siegfried Schönig. 1959. DR.MED.DENT. University of Heidelberg, Germany.

Critical observation of the casting problem in dental practice (Kritische Betrachtungen über das Gussproblem in zahnärztlicher Praxis). Emil Flaumenhaft. 1959. DR.MED.DENT. University of Cologne, Germany.

Sutures of bones in the treatment of fractures of the lower jaw (Die Knochennähte bei der Behandlung von Unterkieferfrakturen). Christian Outzen. 1959. DR.MED.DENT. University of Hamburg, Germany.

Shape of the skull in prognathism (Schädelaufbau bei Progenie). Ronald Lentz. 1959. DR.MED.DENT. University of Hamburg, Germany.

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Experimental investigations of the blood coagulum in regard to its clinical significance in oral surgery (Experimentelle Untersuchungen über die Retraktion des Blutkoagulums im Hinblick auf ihre klinische Bedeutung für die Kieferchirurgie). Hermann Maunz. 1959. DR.MED.DENT. University of Tübingen, Germany.

Importance of blood coagulation for the cure of jaw defects (Die Bedeutung der Blutgerinnung, insbesondere der Retraktion, für die Heilung von Kieferknochendefekten). Klaus Dieter Wagner. 1959. DR.MED.DENT. University of Tübingen, Germany.

Contribution to the problem of hereditary hypoplasia of dentin (Ein Beitrag zur Frage der erblichen Dentinhypoplasie). Marianne Röderer. 1959. DR.MED.DENT. University of Tübingen, Germany.

Surgical treatment of postoperative deformation of the jaws occurring after surgical repair of cleft lip, cleft jaw or cleft palate (Die chirurgische Behandlung der postoperativen Kieferdeformierungen nach Lippen-, Kiefer- und Gaumenspalten Operationen). Werner Widmaier, M.D. 1959. DR.MED.DENT. University of Tübingen, Germany.

Historical development and definition of the term "parulis" (Die historische Entwicklung und Umgrenzung des Begriffes "Parulis"). Kurt Gerhard Lorber. 1959. DR.MED.DENT. University of Heidelberg, Germany.

Clinical study of the effects of the antibiotic agent penicillin V in the treatment of osteomyelitis of the jaw (Klinische Studie über die Wirkungen des Antibiotikums Penicillin V in der Behandlung von Kieferosteomyelitis). Kurt Petry. 1959. DR. MED.DENT. University of Heidelberg, Germany.

Diagnosis of mixed tumors in the parotid gland (Die Diagnose der Parotismischgeschwüre). Renate Wessinger. 1959. DR.MED.DENT. University of Heidelberg, Germany.

Periodontal disease in animals (Über die Parodontopathien bei Tieren). Paul Friedrich Zimmermann. 1959. DR.MED.DENT. University of Greifswald, Germany.

Investigations of the properties of the dental material "Terralux Universal Cement" (Werkstoff-"Terraluxkundliche Untersuchungen an Universal-Zement"). Klaus Schmutzler. 1959. DR.MED.DENT. University of Halle/Saale, Germany.

Criticism and approval of "Adhesal" impression material used in construction of extension dentures for edentulous lower jaws (Kritik und Bewährung der "Adhesal" Abdruck Masse für Extensionsprothesen im zahnlosen Unterkiefer). Heidede Wulf. 1959. DR.MED.DENT. University of Halle/Saale, Germany.

Investigations of the clinical applicability of the filling material "Terralux Universal" and its effect on the vital pulp (Untersuchungen über die klinische Verwendbarkeit des Füllmaterials "Terralux-Universal" sowie über seinen Einfluss auf die lebende Pulpa). Joachim Zühlke. 1959. DR.MED.DENT. University of Halle/Saale, Germany.

Alginate and silicone impression materials: comparative investigations of their properties (Alginate und Silikone Abdruck Massen: vergleichende werkstoffkundliche Untersuchungen). Klaus Vogt. 1959. DR.MED.DENT. University of Halle/Saale, Germany.

Clinical experiments with several hypotensive agents (Klinische Untersuchungen mit verschiedenen blutdrucksenkenden Präparaten). Eberhard Gischler, M.D. 1959. DR.MED.DENT. University of Cologne, Germany.

Investigation of the pneumatization of the crista galli with regard to the paranasal sinus and the maxillary sinus (Untersuchungen über die Pneumatisation der Crista galli, unter besonderer Berücksichtigung der Beziehungen zu den Nebenhöhlen der Nase und des Mundes). Christel Heringhaus. 1959. DR.MED.DENT. University of Cologne, Germany.

	Endodontics	
Contents	Healing process. Fukunaga595	
	Root resection. Hiatt595	
Operative dentistry	Fractures	
New intraoral vibrator. <i>Karlström</i>	Progressive hemiatrophy. <i>Bramley</i>	
Orthodontics	Extractions	
Sagittal deformities of jaw. Baz581	Retained roots of teeth. Helsham597	
Orthodontic treatment for children582	Erythromycin sulfanilamide. Mourfield598	
Pedodontics	Oral surgery	
Care of retarded children. Snyder583	Bone homografts. <i>Krømer</i>	
Periodontics		
Effects of desalivation. Gupta584	Anesthesia and analgesia	
A new periodontal dressing. Baer584	Anesthesia in dentistry. Schön601	
Apical periodontitis. Messina585	The placebo effect. Barber	
Diabetes in young adults. Williams586	Mechanism of hypnosis. West603	
Diabetes in young addits. Walland	Etymology of some words. Schmidt603	
Prosthetic dentistry	Hydroxydione anesthesia. Rollenhagen604 Local anesthetic agents. Truant604	
Jointed elastic splint. Gottfriedsen587  A new investing process. Bell588	Intravenous premedication. Burch605	
Rest vertical dimension. Roberts	Roentgenology	
Design of standard trays. Nyquist589	Maxillofacial angiography. Schmidt606	
Implant denture construction. <i>Uhlig</i> 590	Impacted upper cuspid. Mella606	
Bone deformation under dentures. Sharry592	Mutation in man. Mann	
Case reports	Therapeutics	
Midline ameloblastoma. Castleman593	Mikulicz's aphthae. Cooke608	
A case of scurvy. Cowan	Anaphylactoid reactions. Batson608	
Burning sensations in mouth594	Staphylococcal infections. Thiele609	
Hypertrophy of parotid gland594	Chronic herpes simplex. Rosenthal610	
Unilateral nocturnal salivation594	Impairment of judgment by drugs. Smith611	
	1 , , , , , , , , , , , , , , , , , , ,	

Effects of aspirin. Abelin	Oncology
Inflammatory processes. <i>Heilmeyer</i>	Oral cancer in women. Dalitsch
Histology	Sanvary giant tunors020
Hard and soft tissues. Istock	Bacteriology
Calcification rates. Kraus614	Upper respiratory flora. Harvey627
Public health dentistry	Physiology
	rilysiology
The Jay diet plan. Rider615	Parotid secretion rate. Chauncey
The methyl red test. Hardwick615	Gingival pockets. Brill628
Fluorine in millet. Müller616	Sagittal condylar guidance. Posselt629
Periodontal disease in India. Greene	Masticatory muscles in sleep. Kraft629
Fluorine idiosyncrasy. Rudolf617	
Water fluoridation practices. Moore618	
Infectious nature of caries. Keyes618	General
	Dental metallurgy. Schlegel630
Biochemistry	Old instrument cabinet. de Maar632
Transaminase in saliva. Dreizen	Noise of turbine drill. Robin632
Effect of hydrogen peroxide. Shapiro620	Development of dental drill. Stephens 633
Effect of figure general personner simple control of	Diabetes mellitus. Juna634
	Ingestion of plaster of paris634
Pathology	
Syndromes of head and neck. Gelb621	New equipment
Temporomandibular arthrosis. Ferrigno621	
Masseteric hypertrophy. Guggenheim622	Equipment news
Premature children. Wegner623	
Lentigo maligna. Costello623	Doctoral and Masters' dissertations
Chronic sialadenitis. Sazama623	
Tuberculosis of mouth. Cawson624	Dissertations

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Index of authors

Abelin, I. 611 Arnold, Godfrey E. 621 Askey, Harold C. 592

Baer, Paul N. 584
Barber, Theodore X. 602
Barron, John Mallet 598
Batson, Jack M. 608
Baz, Oğuz 581
Beecher, H. K. 611
Bell, R. Davidson 588
Berli, W. 611
Blechman, Harry 584
Bramley, Paul 596
Brat, Ved 620
Brill, Niels 628
Burch, Richard J. 605

Castleman, Benjamin 593 Cawson, R. A. 624 Chambers, F. W., Jr. 613 Chauncey, Howard H. 628 Cohen, Leon B. 622 Cooke, B. E. D. 608 Costello, M. J. 623 Cowan, Adrian 593

Dalitsch, Walter W. 625
DeFeo, C. P. 623
de Maar, F. E. R. 632
Deufmann, F. J. 606
Dreizen, Jo G. 620
Dreizen, Samuel 620
Drummond-Jackson, S. L. 600
Dunlap, Marjorie B. 627
Dyson, James E., Jr. 615

Ershoff, Benjamin H. 620

Ferrigno, Peter D. 621 Fisher, S. B. 623 Forbes, Alec 596 Frost, Bettina M. 609 Fukunaga, Kinji 595

Gelb, Harold 621 Gottfriedsen, J. P. 587 Greene, John C. 617 Greene, Nicholas M. 603 Guggenheim, Paul 622 Gupta, O. P. 584

Hardwick, J. L. 615 Harvey, Henry S. 627 Heilmeyer, L. 612 Helsham, R. W. 597 Herlands, Robert E. 589 Hiatt, W. H. 595 Hiemeyer, V. 612 Hoyer, Heinz 592

Istock, John T. 613

Jordan, William A. 583 Juna, Stanislav 634

Karlström, Sam 579 Keyes, P. H. 618 Knopp, Judith J. 583 König, K. G. 614 Kraft, Ewald 629 Kraus, B. S. 614 Krømer, Heyman 599 Kutscher, Austin H. 589

Lindström, Dorrit 596 Louis, John D. 612 Lucca, John J. 589 Lyon, Harvey W. 613

Mahan, Charles J. 586
Mann, W. D. 607
Mella, Lino 606
Mercadante, James L. 589
Messina, A. 585
Meyer, Irving 625
Miller, Clarence W. 613
Moore, George W. 618
Mourfield, W. R., Jr. 598
Mühlemann, H. R. 614
Müller, Walther 616

Nyquist, Göte 589

Posselt, Ulf 629

Rateitschak, K. H. 614 Rider, Ernest A. 615 Riley, W. D., Jr. 605 Roberts, Mark 588 Robin, Ian G. 632 Roland, Norman 589 Rollenhagen, J. E. 604 Rosenthal, S. L. 610 Rudolf, Werner 617

Sazama, Leon 623 Schlegel, H. 630 Schmidt, Kurt F. 603 Schmidt, H. W. 606 Schön, Fritz 601 Scigliano, John 584 Shannon, Ira L. 628 Shapiro, Max 620 Sharry, John J. 592 Shklar, Gerald 625 Smith, D. C. 580 Smith, G. M. 611 Smith, James R. 605 Snyder, John R. 583 Spies, Tom D. 620 Stahl, S. Sigmund 584 Stebbins, Harcourt M. 605 Stephens, Richard R. 633 Stone, Robert E. 620 Sumner, Charles F. 584

Takman, B. 604 Thiele, E. H. 609 Truant, A. P. 604

Uhlig, Horst 590

Valiant, Mary E. 609 Vazirani, Sunder J. 625

Wegner, Herbert 623 West, Louis J. 603 Williams, R. C., Jr. 586

Zegarelli, E. V. 589

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